

STATE OF HAWAII PRIMARY CARE NEEDS ASSESSMENT DATA BOOK 2009



Family Health
Services Division



FAMILY HEALTH SERVICES DIVISION
HAWAII DEPARTMENT OF HEALTH
January 2010

FOREWORD

The Hawai'i Department of Health is pleased to present this sixth edition of the *Primary Care Needs Assessment Data Book* (Data Book). This version has been substantially revised based on input from community stakeholders to better characterize the scope of primary care. In particular, I would like to thank the community health centers and the Hawai'i Primary Care Association for their guidance and suggestions for improvement.

The Data Book is intended to serve as a source of comparative health statistics on 28 primary care service areas in the State of Hawai'i. By presenting information on small areas, the document provides a glimpse of the variation among communities in terms of selected risk and resource indicators. This enables communities not only to examine their specific needs, but also to have a sense of the big picture as they assess their own health care needs and problems over time.

It is my hope that this document will be a useful source of quantitative information to health policy makers, planners and all of us in the community who share a common desire to improve access to primary care, especially for the underserved and vulnerable populations of Hawai'i.

Please take a moment to complete the attached survey about the usefulness of the data book.



Chiyome Leinaala Fukino, M.D.
Director of Health

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- Hawai'i Department of Health, Office of Health Status Monitoring
- Hawai'i Department of Health, Behavioral Risk Factor Surveillance System
- Hawai'i Department of Health, Family Health Services Division
- Hawai'i Department of Labor and Industrial Relations, Research and Statistics Office
- Hawai'i Department of Human Services, Information Systems Office

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A special Mahalo to Tuyet Hayes for assistance in the layout and formatting of this document.

To request additional copies of the *Primary Care Needs Assessment Data Book*, call (808) 733-8364 or fax (808) 733-8369.

The *Primary Care Needs Assessment Data Book* is also available on the internet at:
<http://hawaii.gov/health/doc/pcna2009databook.pdf>

PRIMARY CARE NEEDS ASSESSMENT DATA BOOK FEEDBACK SURVEY

Family Health Services Division
Attn: PCNA Data Book Feedback Survey
3652 Kilauea Avenue
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The Family Health Services Division is committed to making the *Primary Care Needs Assessment Data Book* as useful and user-friendly as possible. Please complete this questionnaire and mail or fax it to us. Mahalo for your assistance.

Organizational Identity (circle one)

1. Your entity is best described as a:

- | | |
|---------------------------------------|---------------------------------|
| (a) Community non-profit organization | (b) Government office |
| (c) Student/Educational institution | (d) For-profit medical provider |
| (e) Political representative | (f) Private citizen |
| (g) Other: _____ | |

2. Your organization's focus can best be described as:

- | | |
|-------------------------------|---------------------------|
| (a) Health care services | (b) Planning |
| (c) Government representation | (d) Community development |
| (e) Other: _____ | |

Feedback on the data book (select all that apply)

3. The data book helps you accomplish:

- | | |
|---|-----------------------------------|
| (a) Planning | (b) Needs assessment |
| (c) Grant writing | (d) Facility or services planning |
| (e) Recruitment or retention of providers | (f) Other: _____ |

4. Which health indicators/information did you find to be most useful?

5. Which health indicators/information did you find to be least helpful?

6. What other data/information would you like included in future data books?

7. This data book is accessible on the Hawai'i Department of Health website. Would you still prefer to receive a printed version of future data books? (YES) (NO)

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CHAPTER 1: INTRODUCTION

PURPOSE

The *Primary Care Needs Assessment Data Book* is a compendium of comparative health statistics on 28 primary care service areas in the State of Hawai'i. It is intended to assist policy makers, health planners, health care professionals and community members in making assessments of the relative health risks and primary health care needs of these communities. This data book will demonstrate significant differences in risks related to geography, but it is important to be aware that there are other characteristics such as race/ethnicity, gender, age, education, poverty, and other factors that may explain the observed disparity. In strategic planning to address differences at the community level, it is important to consider the impact of all measures of disparities.

HISTORY OF THE DATA BOOK

In the early 1990's, meetings were held to develop the *Primary Care Access Plan* for the State of Hawai'i, and brought together stakeholders from the public and private sectors to identify primary care needs and recommend appropriate allocation of resources to ensure the best possible primary care services for the people of Hawai'i. In 1994, the *Primary Care Access Plan* was released and included the development of a *Primary Care Needs Assessment Data Book* that could be used for strategic planning purposes.

Primary care was defined in this plan to be the integration of services that promote and preserve health, prevent disease, injury and dysfunction, and provide a regular source of care for acute and chronic illness and disabilities. Primary care providers are seen as the entry point into the larger health services system. The primary care provider incorporates community needs, risks, strengths, resources, and cultures into clinical practice while sharing an ongoing responsibility for health care with each family.

Initial editions of this data book primarily focused on maternal and infant health and socio-economic risks, but have since been expanded to include more comprehensive indicators reflecting the diversity of primary care. The 2005 edition of the data book introduced several new indicators including smoking, diabetes, obesity, stroke and heart disease mortality, and some measures of adult oral health. This 2009 revision reorganizes and broadens the scope of the data book. For example, new indicators of uninsured, Filipino, heavy drinking, physical inactivity, high blood pressure, and cancer deaths have been added. Risk factors associated with an increased risk for death and the three leading causes of death are presented in separate chapters to differentiate between the potentially modifiable risk factors and the final end point of death. Input was obtained through various methods including feedback from surveys submitted on prior editions, presentations to the Hawai'i Primary Care Association, and through an online survey sent to those who were mailed a copy of the previous edition. It is hoped that this data book continues to be a valuable resource on population-level measures of risks along the life course from birth until death.

ORGANIZATION OF DATA BOOK

The remainder of this chapter defines the primary care service areas, introduces the concept of risk indicators and risk assessment, and identifies key limitations inherent with the data available and their impact on interpretation of the data. The second chapter highlights the Family Health Services Division's Primary Care Office and its role in working with community providers to ensure those most at need have access to services. The third chapter summarizes population and socio-economic status indicators for each of the primary care service areas. Chapters four to seven focus on maternal and infant health risk, adult morbidity, the leading causes of death, and adult oral health. In chapters three to seven, specific indicators will be highlighted, and a summary index for risk assessment will rank each primary care service area relative to other areas in the same county and for the State of Hawai'i. The methodology used to create these indices of risk will be discussed later in this chapter.

DATA SOURCES

Data was collected from both public documents and unpublished files by several government agencies, namely: the United States Bureau of the Census, for demographic data from the 2000 census; the Hawai'i Department of Health, Office of Health Status Monitoring, for vital statistics data, the Behavioral Risk Factor Surveillance System (BRFSS) Program, for adults that are uninsured, have morbidity as measured by risk factors, and oral health data; the Hawai'i Department of Labor and Industrial Relations, Research and Statistics Office, for labor market statistics; and the Hawai'i Department of Human Services, Information Systems Office, for financial assistance data.

United States Bureau of the Census

The U.S. Census counts every resident in the United States, and is required by the Constitution to take place every 10 years with the next count to take place in 2010. Census information affects the numbers of seats each state occupies in the U.S. House of Representatives. Data from the Census can be analyzed to determine demographic information such as number of residents, their ages, their race/ethnicity, family composition, and other measures living in a particular census tract.

Vital Statistics

Vital Statistics is coordinated by the Office of Health Status Monitoring (OHSM) in the Hawai'i Department of Health and collects important information about births, deaths, and marriages in the state. This data is used to report on indicators of health status for the state.

Behavioral Risk Factor Surveillance System Survey

The Behavioral Risk Factor Surveillance System (BRFSS) is a state-based health survey that collects information on adult health risk behaviors, preventive health practices, and health care access primarily related to chronic disease and injury. The BRFSS is a Centers for Disease Control & Prevention funded survey that has been implemented in Hawai'i since 1986. It is a random-digit telephone-based annual survey that provides weighted estimates to reflect those living in Hawai'i. Since 2000, the number of respondents has increased from approximately 2,000 to 6,000 adults 18 years of age and over.

DELINEATION OF PRIMARY CARE SERVICE AREAS

Primary care service areas were selected to describe the delivery of primary health services in the State of Hawai'i through participation of multiple stakeholders in the early 1990's. The rural health associations of the Hawai'i, Maui and Kaua'i Counties delineated *rational service areas* under their respective jurisdictions. The Needs Assessment Committee of the Primary Care Roundtable participated in the delineation of *rational service areas* for Honolulu County. These *rational service areas* will be referred to as primary care service areas in this report. Clustering of neighborhoods into these primary care service areas was intended to provide information below the county or island level with demarcation between adjacent neighborhoods. Census tracts were used in defining these areas due to their availability in census and vital statistic data. . The size of the population in these areas, based on the 2000 U.S. Census data, vary from 160 individuals in Ni'ihau and 1,855 in Hāna to 272,752 in 'Ewa and thus direct comparisons in estimates between primary care service areas are limited and will be discussed later in this chapter. These areas may be readdressed due to shifts in populations with the release of data from the 2010 U.S. Census. Clusters of census tracts were used to categorize these areas and are summarized in Table 1.

Kalawao County

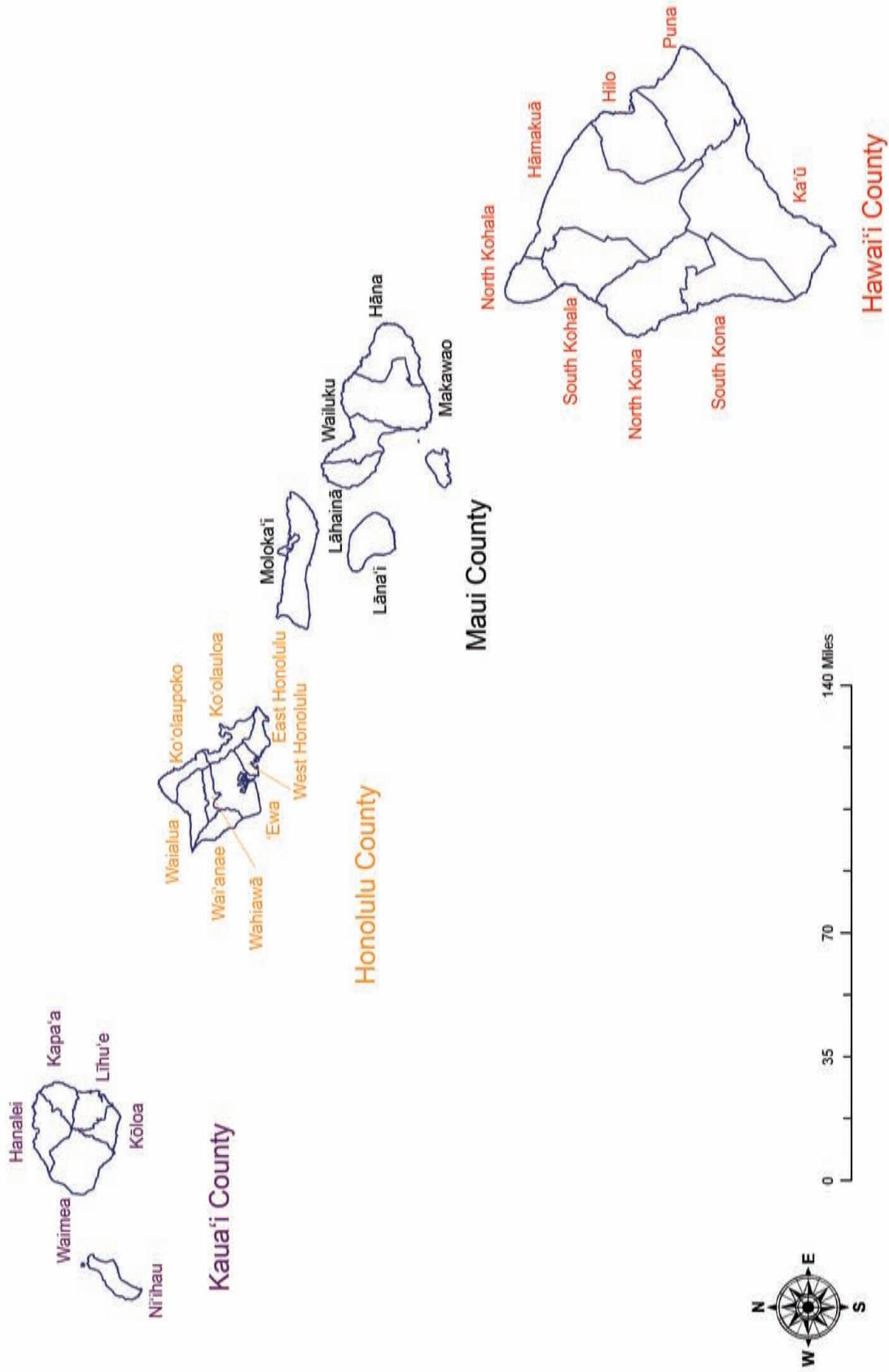
Kalawao County occupies the Kalaupapa Peninsula on Moloka'i. The county does not have its own county government, and is administered by the Hawai'i State Department of Health. Its occupants are leprosy (Hansen's disease) patients who chose to remain after 1969 when the quarantine policy was lifted. An agreement with the state permits the remaining residents to reside there for the remainder of the lives. Access to the county by the public is restricted. The U.S. Census Bureau's 2008 population estimate had Kalawao's population at 117 with a median age of 58.6. Because Kalawao is a small, institutionalized population with unique social-demographic characteristics, its health data is generally not reported with those of the general population. For this data book, due to limitations described, general data is not included for Kalawao County.

Ni'ihau

Ni'ihau is located southwest of the island of Kaua'i and is part of Kaua'i County. The island has been privately owned since 1864. Access to the island is severely restricted. The 2000 U.S. Census had Ni'ihau's population at 160. The population fluctuates as people move to and from Kaua'i for educational and economic opportunities. Due to the inability to compile data and information, data for the island of Ni'ihau is generally not reported. Medical services are generally acquired on the island of Kaua'i. Due to its small population, absence of data, and unique social-demographic characteristics, health data is generally not reported for the island. Although Ni'ihau was one of the original primary care service areas identified in the *Primary Care Access Plan*, it will not be included in the list as a primary care service area for any of the indicators due to the limitations described above.

Primary Care Service Areas and the BRFSS Data

BRFSS data is collected at the zip code level. When zip codes overlap census tracts, individuals are assigned to a census tract using a random number calculation. For example, zip code 96743 overlaps both census tracts 217 (South Kohala) and 218 (North Kohala), but 96% of the population with a 96743 zip code reside in census tract 217 based on the 2000 U.S. Census. Therefore, we randomly selected 96% of the respondents with this zip code to be assigned to South Kohala, with the remaining 4% being assigned to North Kohala. Additionally, due to the small population in Ni'ihau and the lack of widespread land line telephones on the island, they were unlikely to be captured in the BRFSS survey. Therefore, all respondents with a zip code 96769 were assigned to the primary care service area of Waimea which shares the same zip code.



Map 1: Location of Primary Care Service Areas

Table 1: County and Primary Care Service Areas by Census Tract(s)

County	Primary Care Service Areas	Census Tract(s)
Honolulu County	East Honolulu	1–45
	West Honolulu	46–72
	‘Ewa	73–89
	Wahiawā	90–95
	Wai‘anae	96–98
	Waialua	99–100
	Ko‘olauloa	101–102
	Ko‘olaupoko	103–113
Hawai‘i County	Hilo	201–209
	Puna	210–211
	Ka‘ū	212
	South Kona	213–214
	North Kona	215–216
	South Kohala	217
	North Kohala	218
	Hāmākua	219–221
Maui County	Hāna	301
	Makawao	302–305
	Wailuku	306–313
	Lāhainā	314–315
	Lāna‘i	316
	Moloka‘i w/o Kalawao	317–318
Kaua‘i County	Hanalei	401
	Kapa‘a	402–403
	Līhu‘e	404–405
	Kōloa	406–407
	Waimea	408–409
	Nī‘ihau	410

RISK INDICATORS

A quantitative measure of the health and socio-economic risk faced by a population is used as a proxy for measuring the level of need for primary care services. It is implicitly assumed that the higher the measured risk is in a particular service area, the greater is the perceived need for primary care services. While the risk assessment approach may not be sufficient to capture all the complex dimensions of need, it allows for ease and objectivity in the comparative analysis of service areas. Other favorable features are the reasonableness of the data requirements and the flexibility it allows in the selection of risk indicators. Risk indicators were selected in this data book based on input from stakeholders and availability of data at the census tract or zip code level.

RISK ASSESSMENT AND INDICES

Individual indicators only reflect specific topics. To better assess the overall risk for the primary care service area, it is helpful to combine the individual indicators into a composite measure that allows some comparison or assessment of risk across areas. The Klerman-Rosenbach model¹ approach to risk assessment and will be used for this report. Five risk indices were developed:

a) Socio-economic Risk Index

1. Percent of Population 65 Years of Age and Over,
2. Percent of Population Below 200% of Federal Poverty Level,
3. Percent of Civilian Labor Force Unemployed,
4. Percent of Population 18 Years of Age and Over with No High School Diploma,
5. Percent of Households Receiving Financial Aid, and
6. Percent of Households Receiving Food Stamps.

b) Maternal and Infant Health Risk Index

1. Infant Mortality Rate,
2. Percent of Births with Less Than Adequate Prenatal Care Utilization,
3. Percent of Births with Low Birth Weight,
4. Percent of Births to Teens 10 to 17 Years of Age, and
5. Percent of Births to Mothers with Pre-Existing Medical Conditions.

c) Morbidity Index

1. Percent of Adults who are Obese,
2. Percent of Adults who Smoke,
3. Percent of Adults who are Heavy Drinkers,
4. Percent of Adults with No Physical Activity,
5. Percent of Adults with Diabetes, and
6. Percent of Adults with High Blood Pressure.

¹ Klerman, Lorraine V. and Margo Rosenbach. *Need Indicators in Maternal and Child Health Planning*. A manual developed at the Florence Heller Graduate School for Advanced Studies in Social Welfare, Brandeis University, Fall 1984.

d) Mortality Index

1. Stroke (Cerebrovascular Disease) Mortality Rate,
2. Diseases of the Heart Mortality Rate, and
3. Cancer (Malignant Neoplasm) Mortality Rate.

e) Adult Oral Health Risk Index

1. Percent of Adults Who Did Not Visit a Dentist Within the Past Year,
2. Percent of Adults Who Ever Had Permanent Teeth Removed, and
3. Percent of Adults Who Did Not Have Their Teeth Cleaned Within the Past Year.

Methodology for Risk Scoring

For each service area, a standardized score is computed for socio-economic risk, maternal and infant health risk, morbidity risk, mortality risk, and adult oral health risk. The standardized score is computed as follows:

$$SS_{ij} = (X_{ij} - X_{\text{mean}}) / SD_j, \text{ where}$$

SS_{ij} = standardized score for the i^{th} service area on the j^{th} variable
 X_{ij} = raw score for the i^{th} service area on the j^{th} variable
 X_{mean} = mean for the j^{th} variable
 SD_j = standard deviation for the j^{th} variable

A composite risk score (RS) is then computed for each service area by adding the standardized scores for all variables, i.e.,

$$RS_i = SS_{i1} + SS_{i2} + \dots + SS_{in}, \text{ where}$$

RS_i = composite score for service area I
 $SS_{i1} + \dots + SS_{in}$ = the standardized scores for service area I on variable 1 to variable n.

This method assumes that the standardized scores are additive. For this reason, the results must be interpreted with care.

A high positive risk score implies that the population in the service area is at a relatively high risk for poor health. A low negative risk score implies a relatively low risk for poor health. It must be emphasized that the absolute numbers, by themselves, are less meaningful than what is revealed when interpreted in relative terms. Moreover, the scoring is based on a few selected indicators and changes to these variables may affect the risk scores and the ranking of service areas.

A summary table is included for each index showing the estimate for each indicator making up the index by primary care service area, followed by the overall ranking for the composite risk for each area. Remember that this ranking process is only a relative measure and that an area's rank may change not only due to its own score but also due to an increase or decrease in the score of another service area.

DATA LIMITATIONS AND INTERPRETATION

Comparison and Ranking of Service Areas

The 27 service areas are unweighted with respect to the population, i.e. they are treated equally regardless of the absolute size of the population in the area. This is to avoid the bias towards areas with extremely large population sizes, e.g., East and West Honolulu relative to Hāna or Ka'ū. Also, the ranking of service areas is unweighted with respect to the variables, i.e., the standardized scores for each of the indicators are simply added up to arrive at a composite index. It must be noted that the ranking is based on only a few selected indicators and that any changes to these variables may also affect the ranking. Finally, it must be emphasized that the numbers should be interpreted as relative rather than as absolute measures of risk.

The Small Numbers Problem

The *Small Numbers Problem* is a result of a small at-risk population. While there are clear advantages to using rates as a measure of frequency, there is a major limitation when the number of events (e.g., births, population) in the denominator is very small. To reduce this problem, data for six years was aggregated, whenever possible. However, even with such aggregation, the events number very few for some service areas. It is therefore advised that considerable caution be exercised in the interpretation of these rates, particularly in making comparisons. For example, in cases when the numerator of a multiple year period refers to a very small number of events (fewer than 20), the confidence interval is often too wide to make meaningful comparisons. In these instances a standardized ratio can be computed instead of a confidence interval.² A standardized ratio is the relationship between the observed number of events versus the expected number of events. To calculate the expected number of events, state rates are applied to the area denominator to generate an expected number of events if the area rate was the same as the state rate. The equation for the expected number of events is:

$$\text{Area Denominator} \times \text{State Rate} = \text{Expected Number of Events}$$

A standardized ratio can then be calculated by dividing the observed number of events by the expected number and multiplying by 100. When the standardized ratio is greater than 200, the area in question is likely to have a rate that is significantly higher than the overall rate for the state.

$$\text{Standardized Ratio} = \frac{\text{Observed Number of Events}}{\text{Expected Number of Events}} \times 100$$

Notes on Confidence Intervals

In order to assess whether a particular primary care service area's rate on a health status indicator is significantly different from some baseline rate or from the county or state average, it is necessary to compare the rates. But simply looking at the rates and determining which is higher or lower may not be meaningful when the *Small Numbers Problem* exists. Random fluctuations occur on a year-to-year basis in the number of deaths that occur in a community, apart from the real changes in mortality rates due to epidemics, poor access to care, etc. In areas with a very small population and very small number of deaths, these fluctuations can produce large changes in mortality rates from year to year. This certain amount of variation between rates that can be expected due to chance and is not indicative of true changes occurring in the population is referred to as *random variation*. One way of interpreting the magnitude of random variation between rates is by using *confidence intervals*.

² Family Health Outcomes Project (FHOP), *Guidelines for Using Federal Data Templates with Small Numbers* (May 1, 1997).

The confidence interval calculated for a particular service area rate indicates the expected range of random variation in the estimate. Suppose the service area rate is being compared to the state rate. If the confidence interval for the state rate overlaps the calculated confidence interval for the service area, it can be inferred that the difference between the rates is probably due to random fluctuation (or chance) and there is probably no meaningful difference between the rates. On the other hand, if there is no overlap, it can be concluded that the difference between the rates is meaningful or statistically significant. The smaller the denominator used to calculate the rate for a particular service area, the larger the random fluctuation in the estimate, and the more likely that there may not actually be a meaningful difference between the rates. This is important to bear in mind during the comparison and interpretation of the rates.

An example of the use of confidence intervals³ is as follows:

	Infant Mortality Rate	Confidence Interval	Number of Deaths	Number of Live Births
State	6.9	6.4 – 7.4	731	105,823
Service area X	6.8	5.8 – 7.8	179	26,186
Service area Y	4.7	3.4 – 6.1	47	9,897

Since the confidence interval for the state overlaps that of service area X, it can be concluded that service area X's infant mortality rate is not meaningfully different from the state rate. On the other hand, service area Y's infant mortality rate of 4.7 can be said to be significantly lower than the state rate since the confidence interval for service area Y does not overlap with the confidence interval for the state.

While confidence intervals are not a rigorous test of significance, they provide a reasonable guide to the interpretation of the magnitude of the random fluctuations in the difference between rates. Confidence intervals based on vital statistics information were calculated using the standard formula introduced in the example above on infant mortality. Statistical software, accounting for the complex survey design, was used to calculate the 95% confidence intervals for indicators based on BRFSS data.

MAP DEVELOPMENT

Throughout this data book, we have used Geographical Information System (GIS) software to portray in a graphical manner some key information for the State of Hawai'i. In the first map, we superimpose on a map for the State of Hawai'i, the individual primary care service areas. In our second chapter, we have included overlays of our primary care service areas to demonstrate how they interact with the standard federal designations representing areas at greatest need. As both our primary care service areas and these federal designations are based on census tracts, it is informative to see that some overlap completely; while others only a portion of the primary care service area is considered a federally designated area. For example on Map 2, within the primary care service area of South Kohala, only the census tract corresponding to Waikolola is considered a Primary Care Health Professional Shortage Area (HPSA). Similarly, Kalawao County is considered a Primary Care HPSA, but is not considered one of our primary care service areas.

Additionally, summary maps were developed to graphically portray the state-wide ranking for each risk index. To facilitate interpretation, we divided the ranking for each index into quartiles so that the darkest color represent those primary care service areas with the highest risk (1-6), while the lightest color represents those at the lowest risk (21-27). Kalawao County and Ni'ihau were not included in these rankings and are not colored in summary maps of the risk indices. These summary maps are useful to demonstrate variation in ranking of risks for the primary care service areas, but please refer to the section on *Data Limitations and Interpretation* when making conclusions based on these maps and corresponding tables.

³ Confidence Interval Lower limit = $p - 1.96 * \sqrt{pq/n}$ and Upper limit = $p + 1.96 * \sqrt{pq/n}$. p is the area rate. n is the number of births in the area. q is $1 - p$.

CHAPTER 2: PRIMARY CARE OFFICE, UNINSURED, FEDERAL DESIGNATIONS

PRIMARY CARE OFFICE

The Primary Care Office (PCO) is located in the Department of Health (DOH), Family Health Services Division. This is a comprehensive program that expands access to primary care services for the medically underserved in Hawai'i. The program's following core functions align with the federal Health Resources Service Administration (HRSA), and our state counterparts across the nation who are also recipients of the major source of PCO funding, the Primary Care Services Resources Coordination and Development Grant (PCSRCD):

- Support organizational effectiveness and foster collaboration;
- Provide technical assistance to organizations and communities wishing to expand access to primary care for underserved populations;
- Conduct needs assessment(s) and data sharing;
- Support workforce development for the National Health Shortage Corps and safety Net/ Health Center Network; and
- Review and update shortage designation areas.

The Hawai'i PCO works in close collaboration with federally qualified health center's (FQHC's), primary care contractors, Hawai'i Primary Care Association (HPCA), Hawai'i State Office of Rural Health, Hawai'i Area Health Education Center, Native Hawaiian Health Scholarship Program, community stakeholders, and other public, private, and voluntary organizations to support the development, maintenance, and expansion of a statewide comprehensive primary health care system for the medically underserved. An integral part of the program is the provision of high-quality, culturally competent, coordinated, primary care services to the uninsured and under insured through contracts with 16 health centers throughout the state. Medical care, behavioral health, dental treatment, and pharmaceutical services are covered under these contracts. Recent program data demonstrates an ever increasing demand for services.

Obtaining an accurate picture of our communities' health status and needs is accomplished through our needs assessment process. This process is facilitated by the PCO, and one outcome is publication of a biennial data book, which provides essential data for identifying community, technical assistance, shortage designation, health workforce, and primary care health needs. The PCO is responsible for overseeing the Health Professional Shortage Areas (HPSA), and Medically Underserved Area/Populations (MUA/P) designation applications, which document the medical, dental, and mental health needs in specific geographic areas. Once an area receives a shortage designation it is open to important federal programs such as the National Health Service Corps (NHSC), CMS Medicare Incentive Payments, CMS Rural Health Clinic Program, J-1 Visa Waiver Program, Rural Health Clinic certification, and Federally Qualified Health Center (FQHC) and their FQHC Look-A-Likes.

UNINSURED POPULATION IN HAWAII'

Access to quality care is important to eliminate health disparities and increase the quality and years of healthy life for all persons in the United States. Although the lack of health insurance is clearly a major factor impeding access to care, having health insurance does not guarantee that health care will be accessible or affordable. Significant numbers of privately insured persons lack a usual source of care or report delays or difficulties accessing needed care due to costs or insurance problems.¹

In Hawaii'i, there are three major estimates of uninsured status generally reported and are based on the Behavioral Risk Factor Surveillance System (BRFSS) Survey, the Hawaii'i Health Survey (HHS), and the Current Population Survey, The BRFSS and the HHS are both telephone-based surveys weight to reflect the community-dwelling adult population living in the Hawaii'i. The BRFSS is limited to those aged 18 years and older, while the HHS includes estimates for all ages. They are not meant to be representative of households without land line telephones, homeless individuals, those living in group homes, or those living on the island of Ni'i'hau. The Family Health Services Division contracted with the University of Hawaii'i to obtain the latest available estimate for the uninsured from the Current Population Survey Annual Social and Economic Supplement (CPS ASEC).² The CPS ASEC can provide estimates for all ages, gender, and information related to federal poverty level. For the purpose of this report, we will only present information for the CPS ASEC for children (0-18 years), adults (19 years and older), and the overall rate for all ages.

Table 2: State of Hawaii'i Percent Uninsured by Data Source, 2003-2008

	HHS (All ages) (%)	BRFSS (18 and older) (%)	CPS ASEC (All ages) (%)	CPS ASEC (0-18 years) (%)	CPS ASEC (19 and older) (%)
2003	5.2	8.2	9.6	7.2	10.4
2004	5.2	9.0	8.3	3.9	9.7
2005	4.5	7.8	8.4	5.5	9.3
2006	*	8.3	8.8	6.8	9.5
2007	5.2	6.0	7.5	4.9	8.3
2008	4.6	6.3	**	**	**

*Data not available for HHS in 2006.

** Data not available from CPS Update for Calendar year 2008.

This variation in estimates shown in the table is partly explained by the differences in methodologies used to obtain information on the uninsured. We have presented these estimates for the overall population in the above table, and expect that the true estimate is likely closer to that in the CPS ASEC data with a greater degree of underestimation by the HHS and BRFSS. Information at the individual zip code is only available in BRFSS, so we can only present data for uninsured adults by primary care service area using the BRFSS data in this data book.

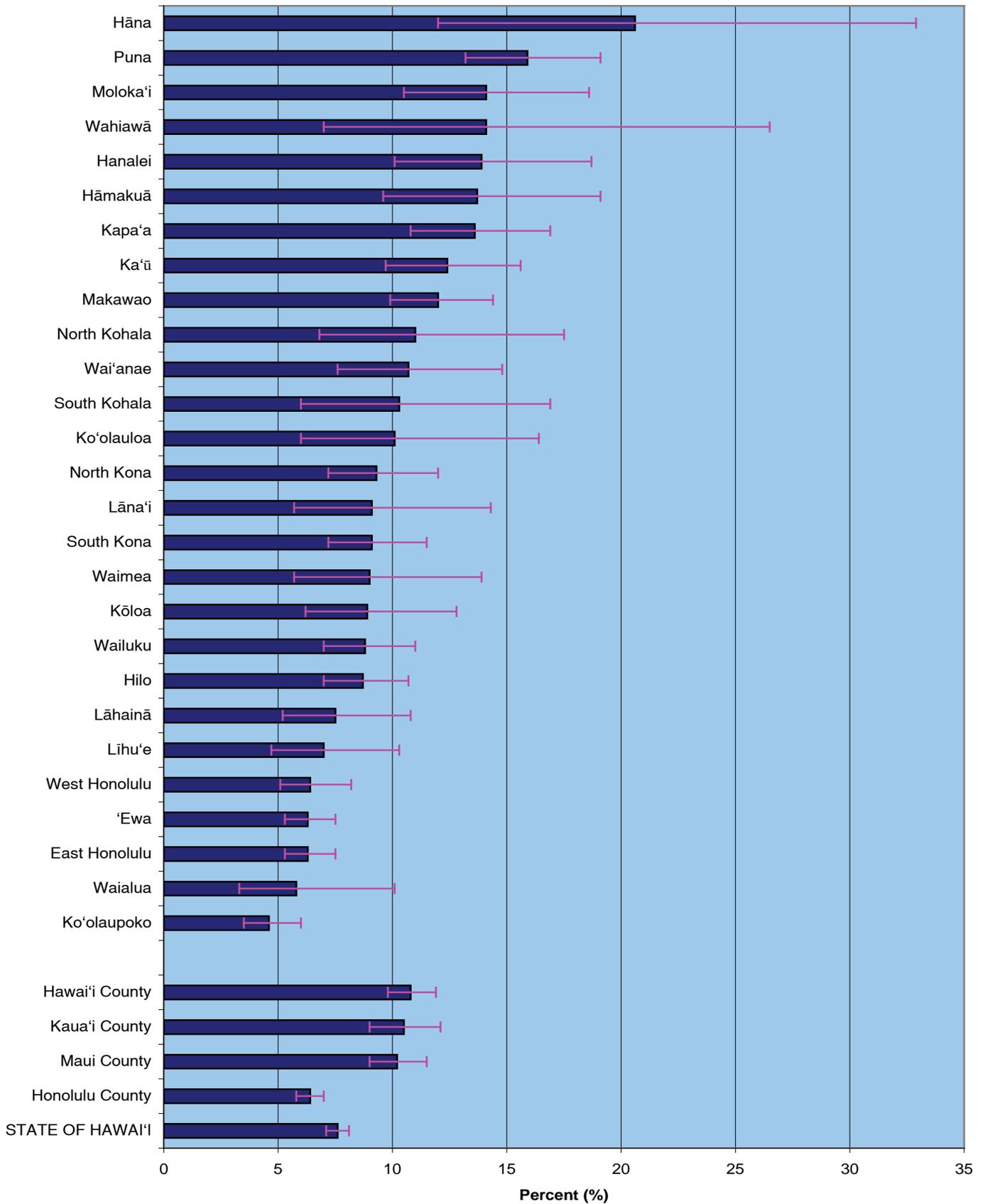
1 U.S. Department of Health and Human Services. Office of Disease Prevention and Health Promotion. <http://www.healthypeople.gov/Document/HTML/Volume1/01Access.htm> [Accessed 5/4/09].

2 Russo G, Lee SH, and Lindo J. 2009. *Hawaii's Uninsured Population: Estimates from the Current Population Survey 1997-2008*. Prepared for the Family Health Services Division, Hawaii'i State Department of Health.

Table 3: Adults Without Health Insurance, 2003-2008

Service Area	Estimated Annual Adult Population	Estimated Annual Number of Adults Without Health Insurance	Percent of Adults Without Health Insurance (%)	95% Confidence Interval
State of Hawai'i	975,872	73,996	7.6	(7.1 - 8.1)
Honolulu County	675,825	43,075	6.4	(5.8 - 7.0)
East Honolulu	179,638	11,346	6.3	(5.3 - 7.5)
West Honolulu	91,050	5,863	6.4	(5.1 - 8.2)
'Ewa	226,174	14,238	6.3	(5.3 - 7.5)
Wahiawā	2,305	325	14.1	(7.0 - 26.5)
Wai'anae	36,700	3,910	10.7	(7.6 - 14.8)
Waialua	30,601	1,782	5.8	(3.3 - 10.1)
Ko'olauloa	10,430	1,052	10.1	(6.0 - 16.4)
Ko'olaupoko	98,926	4,559	4.6	(3.5 - 6.0)
Hawai'i County	121,501	13,133	10.8	(9.8 - 11.9)
Hilo	38,810	3,381	8.7	(7.0 - 10.7)
Puna	18,530	2,955	15.9	(13.2 - 19.1)
Ka'ū	14,665	1,811	12.4	(9.7 - 15.6)
South Kona	13,992	1,275	9.1	(7.2 - 11.5)
North Kona	20,706	1,927	9.3	(7.2 - 12.0)
South Kohala	3,858	396	10.3	(6.0 - 16.9)
North Kohala	4,110	453	11.0	(6.8 - 17.5)
Hāmakuā	6,831	934	13.7	(9.6 - 19.1)
Maui County	102,099	10,423	10.2	(9.0 - 11.5)
Hāna	1,808	372	20.6	(12.0 - 32.9)
Makawao	26,963	3,226	12.0	(9.9 - 14.4)
Wailuku	47,227	4,143	8.8	(7.0 - 11.0)
Lāhainā	13,562	1,023	7.5	(5.2 - 10.8)
Lāna'i	2,088	190	9.1	(5.7 - 14.3)
Moloka'i	10,451	1,469	14.1	(10.5 - 18.6)
Kaua'i County	45,981	4,805	10.5	(9.0 - 12.1)
Hanalei	5,191	721	13.9	(10.1 - 18.7)
Kapa'a	13,469	1,831	13.6	(10.8 - 16.9)
Līhu'e	9,768	683	7.0	(4.7 - 10.3)
Kōloa	10,254	916	8.9	(6.2 - 12.8)
Waimea	7,299	654	9.0	(5.7 - 13.9)

Chart 1: Percent of Adults Without Health Insurance, 2003-2008



Health Professional Shortage Area (HPSA)

A Health Professional Shortage Area (HPSA) means any of the following which has a shortage of health professionals: (a) an urban or rural area which is a rational service area for the delivery of health services, (b) a population group, or (c) a public or nonprofit private medical facility. HPSAs are divided into three major categories according to the type of health professional shortage: primary care, dental and mental health HPSAs. The programs that require HPSA designation are the National Health Service Corps (NHSC) and the Rural Health Clinic Certification Program. The Area Health Education Center (AHEC) Program gives special consideration to centers that serve HPSAs with higher percentages of underserved minorities, and gives special funding priority to centers providing substantial training experience in HPSAs. The Division of Shortage Designation of the Bureau of Health Professions with the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services is responsible for reviewing and designating HPSAs.

Eligibility Criteria: Primary Care Health Professional Shortage Area (HPSA)

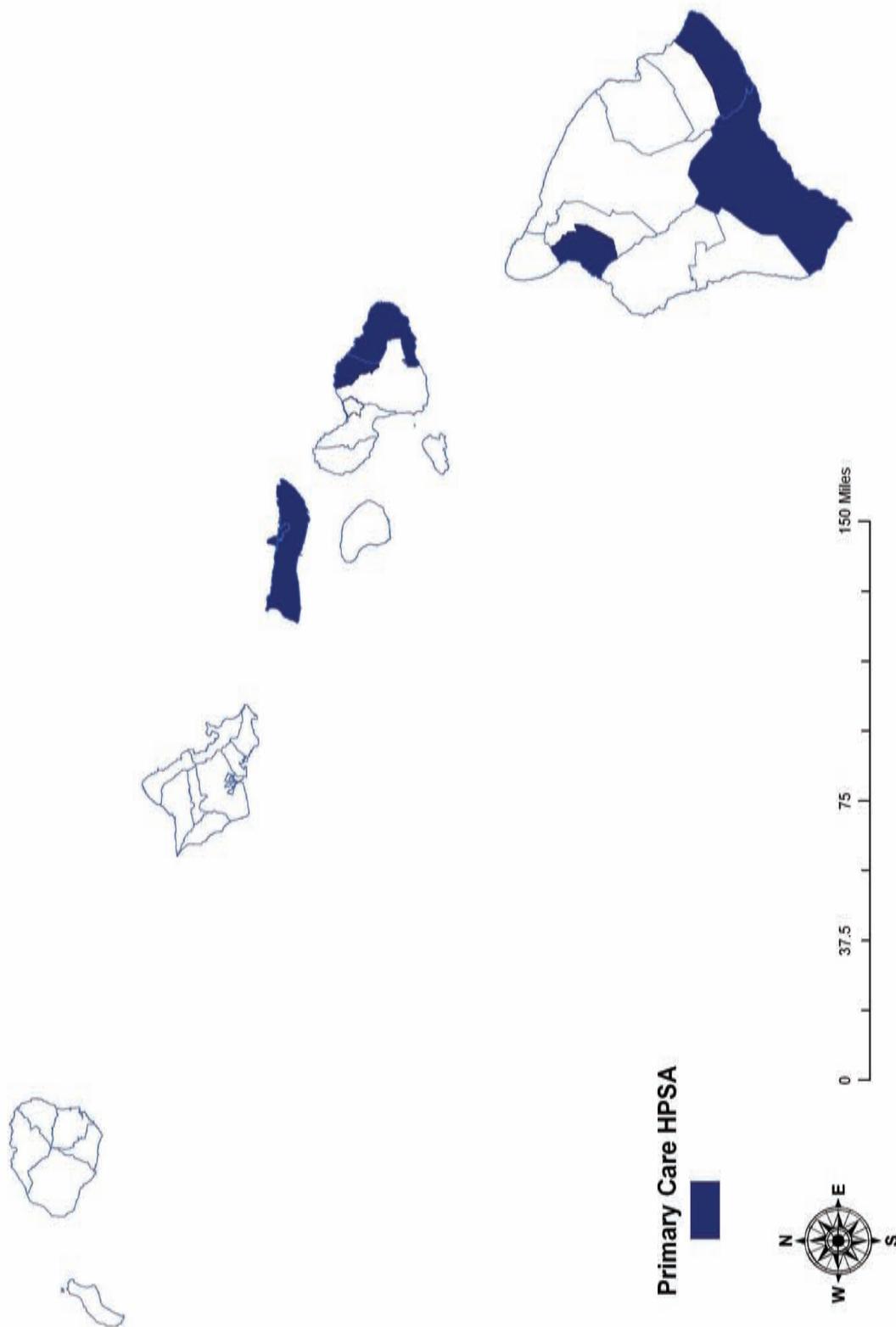
Geographic HPSA

- Rational service area,
- Population to Full Time Equivalent (FTE) primary care physician ratio at least 3,500:1 (high needs area) or 3,000:1 (unusually high needs area). An area is defined as an unusually high needs area if any of the following conditions exist:
 - a) >100 births per year per 1,000 women 15 to 44 years of age,
 - b) >20 infant deaths per 1,000 live births, or
 - c) >20% of households with incomes below poverty.
- Primary care professionals in contiguous areas are overutilized, excessively distant, or inaccessible, if any of the following occur:
 - a) >30 minutes from area center,
 - b) FTE > 2,000:1, or
 - c) Inaccessible due to demographic or socio-economic barriers.

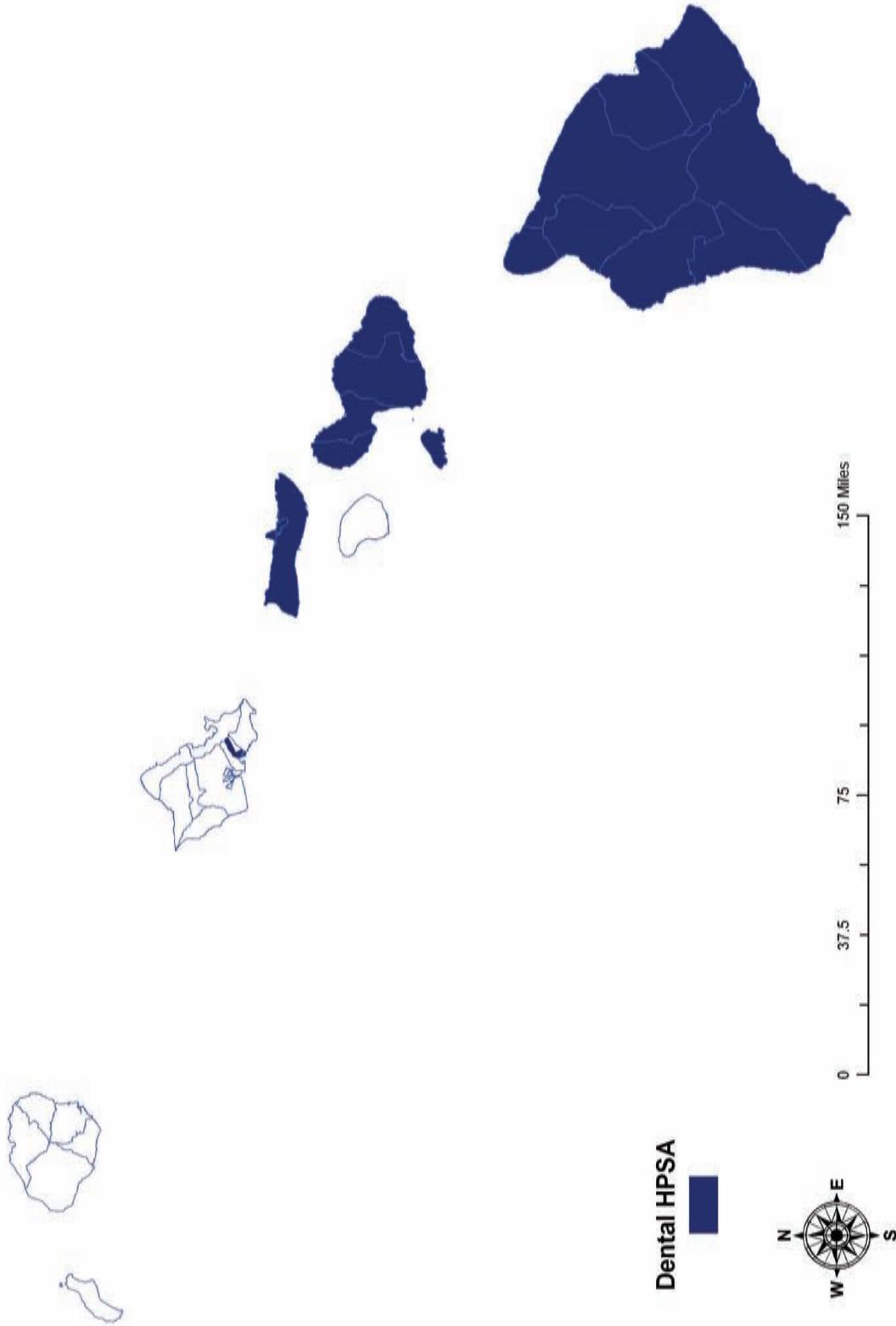
Population group HPSA: if a geographic area does not meet the shortage criteria but a population group within the area has access barriers.

- Low-income: minimum 30% of population at or < 200% of poverty,
- Medicaid-eligible population: minimum 30% of population at or < 200% of poverty,
- Migrant farm workers and families,
- American Indians or Native Alaskans,
- Homeless, or
- Other population isolated by linguistic or cultural barriers or by handicaps.

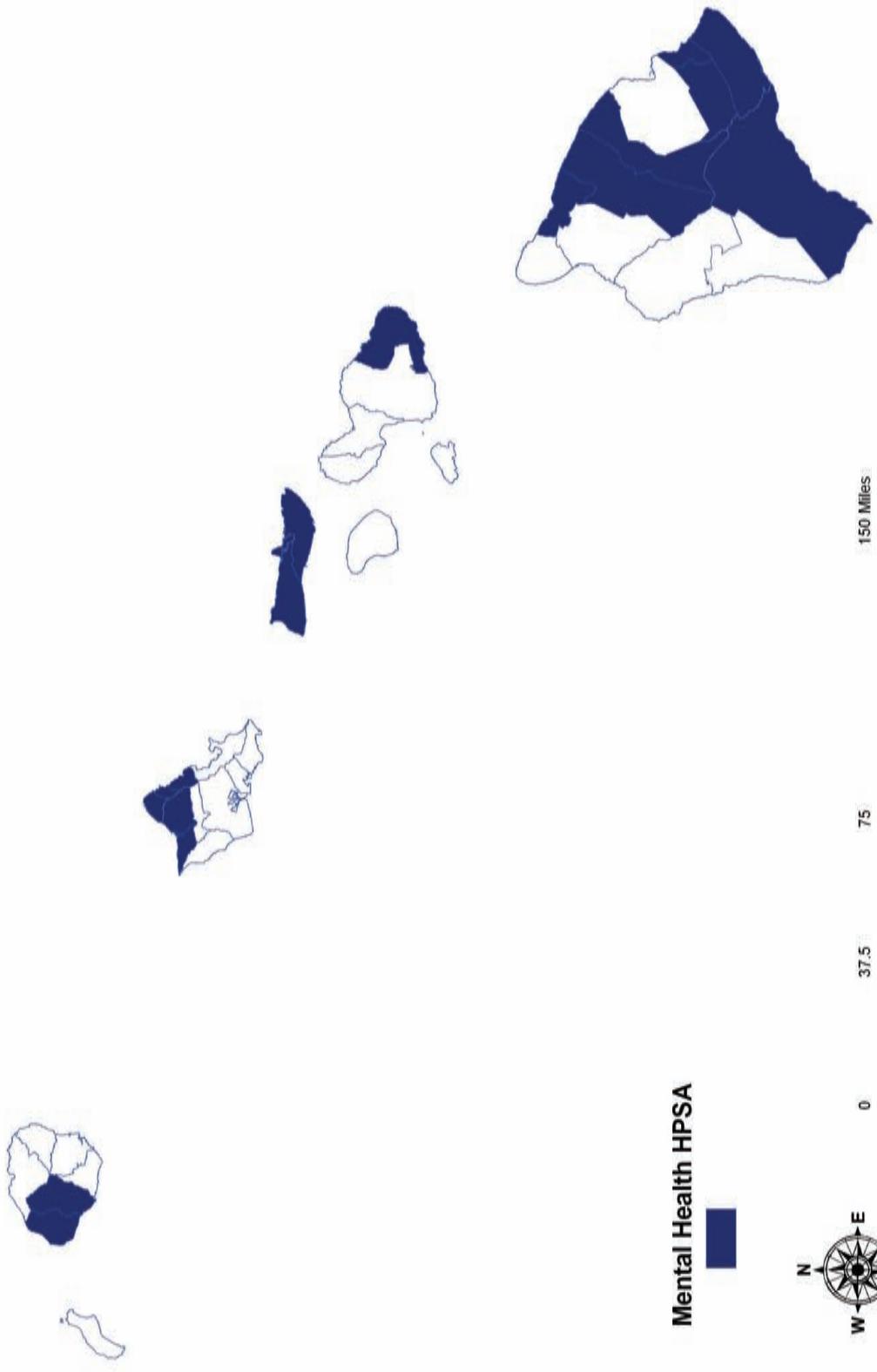
³ Sources: 42 CFR Chapter 1, Part 5; Health Resources and Services Administration, Bureau of Primary Health Care Guidelines; National Health Service Corps website, <http://nhsc.hrsa.gov/>.



Map 2: Location of Federally Designated Primary Care HPSAs



Map 3: Location of Federally Designated Dental HPSAs



Map 4: Location of Federally Designated Mental Health HPSAs

Medically Underserved Area/Population (MUA/MUP)

According to Sections 1302(7) and 330(b) of the Public Health Service (PHS) Act, the term *medically underserved area or medically underserved population* means the population of an urban or rural area designated as an area with a shortage of personal health services. Recipients of Community Health Center (CHC) grant funds are legislatively required to serve areas or populations designated as medically underserved. Grants for the planning, development, or operation of community health centers under Section 330 of the PHS Act are available only to centers that serve designated MUAs or MUPs. Systems of care which meet the definition of a community health center but are not funded under Section 330, and are serving a designated MUA or MUP are eligible for certification as Federally Qualified Health Centers (FQHCs). The Division of Shortage Designation of the Bureau of Health Professions determines MUA/MUP designations.

Eligibility Criteria: MUA

Involves application of the Index of Medical Underservice (IMU) to obtain score on a scale of 0 to 100. An IMU of 62.0 or less qualifies area for designation as MUA.

- Rational service area,
- Percentage of population below 100% of poverty,
- Percentage of population 65 years of age and over,
- Infant mortality rate, and
- Ratio of primary care physicians per 1,000 population.

If total score is over 62.0, an area may still be designated upon documentation of unusual local conditions which are a barrier to access to or the availability of personal health services.

Eligibility Criteria: MUP

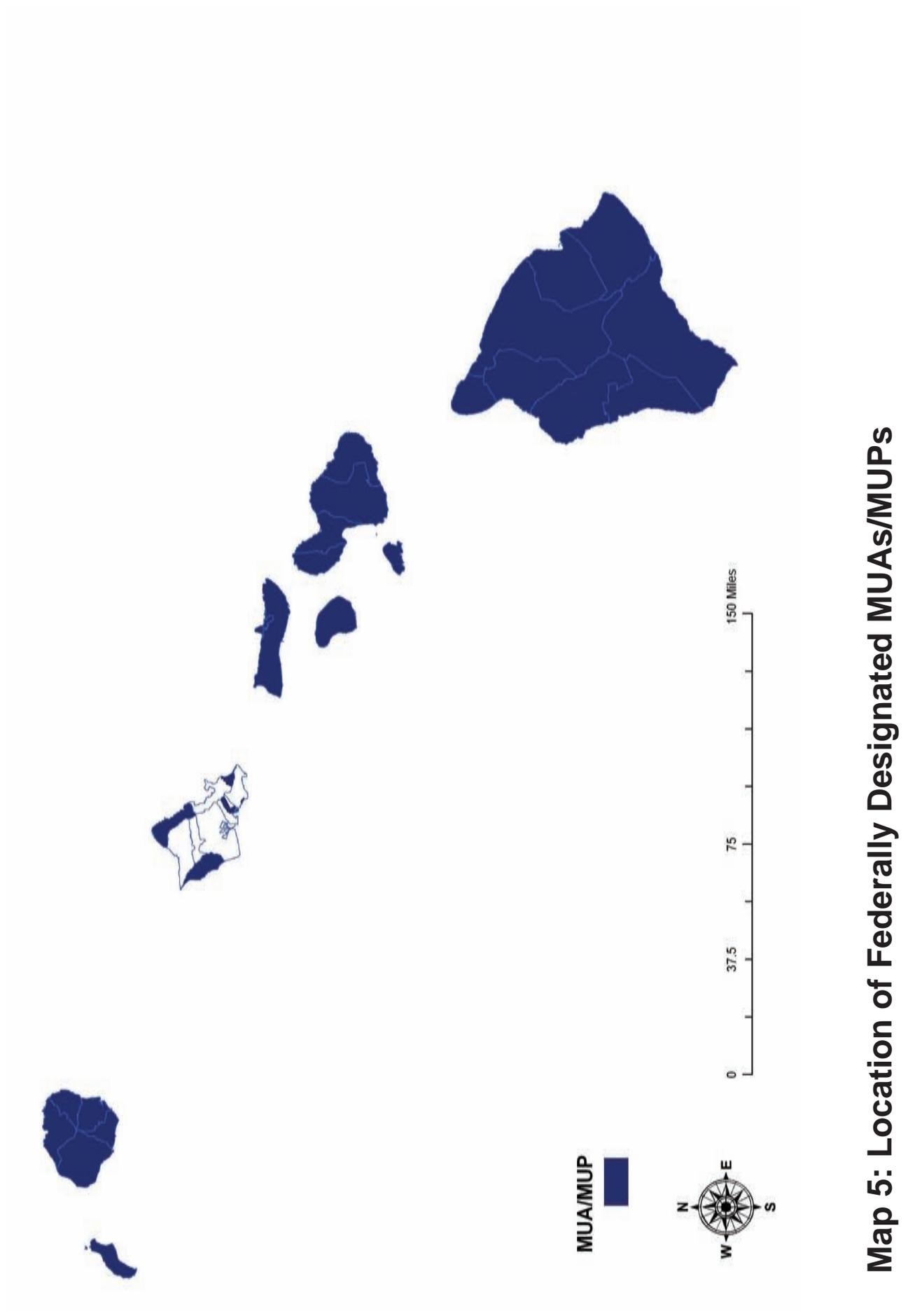
Involves application of the IMU to data on an underserved population group within a geographic area.

- Population with economic barriers (low-income or Medicaid eligible population), or
- Populations with cultural and/or linguistic access barriers to primary care.

Involves assembling data as stated for MUAs except that:

- The population now refers to the population of the requested group within the area and not the total resident population of the area, and
- The number of FTE primary care physicians includes only those serving the requested population group.

If total weighted value is 62.0 or less, the population group qualifies for designation as MUP.



Map 5: Location of Federally Designated MUAs/MUPs

The National Health Service Corps (NHSC)

The National Health Service Corps is operated through the Bureau of Clinician Recruitment and Services of HRSA and is a program for the recruitment of health care providers to serve in HPSAs, including:

- Primary Care Physicians (Family Medicine, General Internal Medicine, General Pediatrics, Obstetrics/Gynecology, General Psychiatry)
- Nurse Practitioners
- Physician Assistants
- Certified Nurse-Midwives
- Dentists
- Dental Hygienists
- Mental and Behavioral Health Professionals (health service psychologists, clinical social workers, licensed professional counselors, marriage and family therapists, and psychiatric nurse specialists)

These health professionals can apply to serve as NHSC:

- Ready Responders (serve on a mobile team as U.S. Public Health Service commissioned officer)
- Obligated Scholars (graduates who have been provided tuition support in return for obligated service in a HPSA)
- Participants in the NHSC Loan Repayment program (professionals who receive loan repayment while serving in a HPSA)

Many types of practices can apply to become eligible sites for the placement of NHSC Ready Responders, Scholars and Loan Repayers, including:

- FQHCs, FQHC Look-A-Likes, and RHCs
- Public Health Departments
- Hospital Affiliated Primary Care Practices
- Managed Care delivery systems
- Group Practices, Clinic Networks
- Solo Practices/Partnerships
- State and Federal Prisons
- U.S. Immigration, Customs & Enforcement
- Tribally Run Indian Health Service Sites and Federal Indian Health Service Sites

More information and application forms for interested health professionals and practice sites can be found at <http://nhsc.hrsa.gov>. For further assistance call the NHSC Help line at 1-800-221-9393 (available from 9 a.m. to 5:30 p.m. EST) or send an e-mail to callcenter@hrsa.gov.

COMMUNITY HEALTH CENTERS AND CLINICS

Access to health care occurs in many settings. Ideally, an individual will have a central medical home where all services are coordinated. This data report focuses on primary care access among three types of community health centers and clinics who provide a broad range of services.

Rural Health Clinic (RHC)

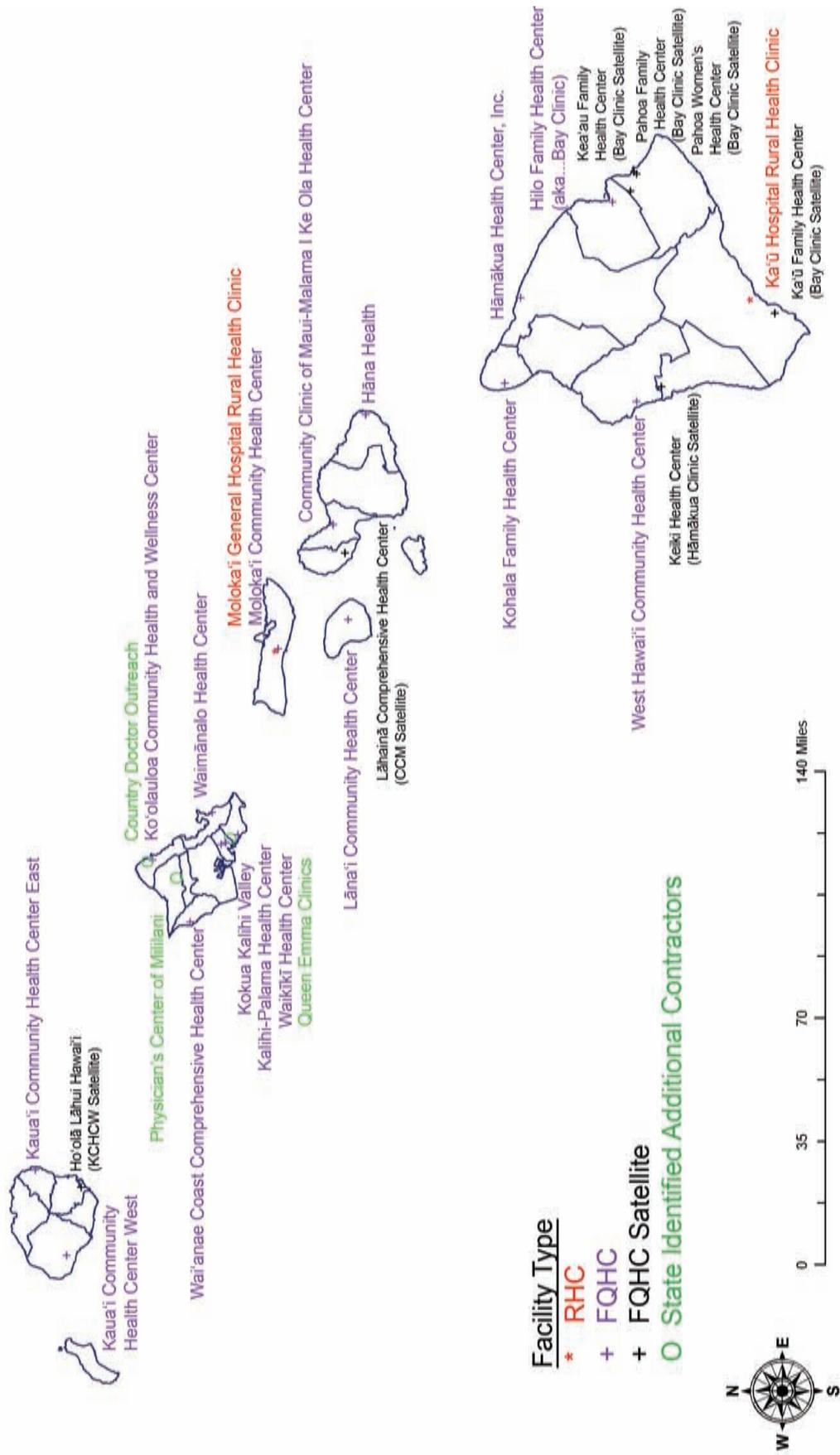
The Rural Health Clinic (RHC) program is intended to increase primary care services for Medicaid and Medicare patients in rural communities. RHC's can be public, private, or non-profit, and must be located in rural underserved areas as designated under Section 1861(aa)(2) of the Social Security Act. An advantage of having a RHC status is the enhanced reimbursement rates for providing Medicaid and Medicare services in a rural area. A RHC is required to use a team approach of physicians and mid-level practitioners such as nurse practitioners, physician assistants, and certified nurse midwives to provide services. The clinic must be staffed at least half time with a mid-level practitioner and must provide the same services that are required of a community health center.

Federally Qualified Health Center (FQHC) and FQHC Look-A-Likes

Community health centers are community-based and patient directed organizations that serve populations with limited access to health care. These include low income populations, the uninsured, those with limited English proficiency, migrant and seasonal farm workers, individuals and families experiencing homelessness, and those living in public housing. A FQHC is a community health center that meet certain criteria under the Medicare and Medicaid Programs (respectively, Sections 1861 (aa)(4) and 1905(l)(2) (B) of the Social Security Act and receive funds under the Health Center Program (Section 330 of the Public Health Service Act). FQHC Look-A-Likes are health centers that have been identified by HRSA and certified by the Centers for Medicare and Medicaid Services as meeting the definition of "health center" under Section 330 of the Public Health Service Act, although they do not received grant funding under Section 330. A Federally Qualified Health Center is an entity which meets the requirements of a federally-funded health center, whether or not it receives a grant under Sections 329, 330 or 340 of the Public Health Service Act. These requirements include being nonprofit, having a community-based board of directors, providing or arranging all the necessary and enabling services, providing care regardless of the ability to pay, and must be in or serve a MUA/MUP. There are 14 FQHC's in Hawai'i to help serve as a safety net. The majority of the FQHC's provides the un- and under insured with primary care services through Department of Health contracts. Many of these FQHC's have satellite sites that expand primary care services to additional areas. In order to simplify the map on the next page, we have only shown the satellite clinics located outside of Honolulu County.

State Identified Additional Contractors

The Department of Health identified the need to provide primary care services to areas that did not meet the requirements for a RHC or FQHC, but were critical in ensuring appropriate access to services. Currently, there are three sites that receive such funding identified through an open and competitive procurement process. These health centers and clinics expand access to primary care services for the medically underserved that are coordinated, culturally sensitive, and focus on health promotion and disease prevention.



Map 6: Location of Community Health Centers and Clinics

HAWAI‘I HEALTH SYSTEMS CORPORATION AND CRITICAL ACCESS HOSPITALS

Hospitals provide advanced services for those with and without health insurance. There are some hospitals with 24 hour emergency services, some with urgent care, and others that focus on long-term care. This section is meant to highlight potential access areas for those requiring the advanced services available at hospitals by highlighting those organized within the Hawai‘i Health Systems Corporation and those designated as a critical access hospital.

Hawai‘i Health Systems Corporation (HHSC)

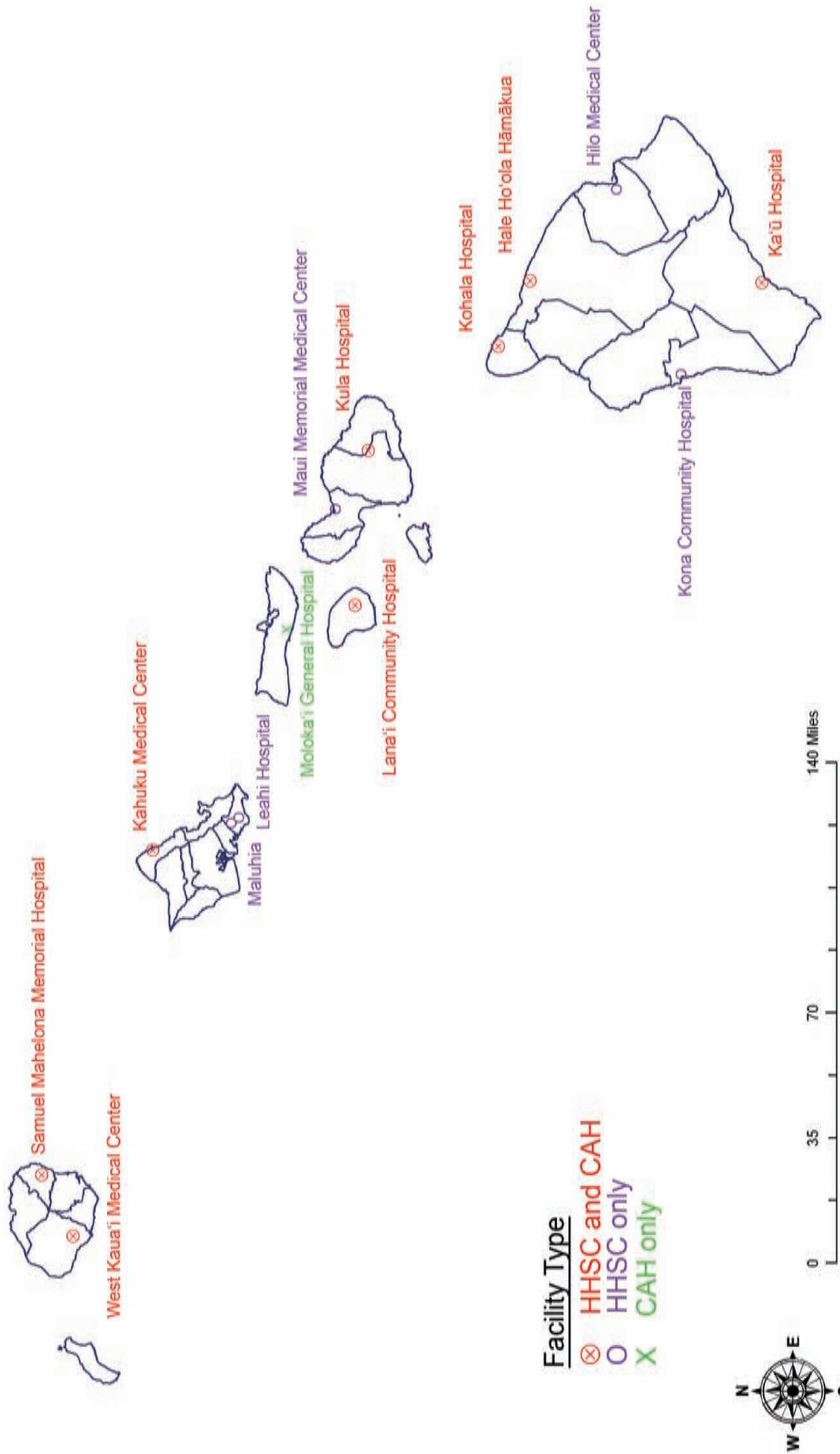
The Hawai‘i Health Systems Corporation (HHSC) was established by the Hawai‘i State Legislature in 1996 to more efficiently and effectively manage and operate the 13 community-based hospitals in the State. The HHSC is the fourth largest public health care system in the United States, and in Hawai‘i, the single largest provider of long-term care services and collectively the largest provider of emergency services. HHSC has restructured the original 13 acute and long-term care hospitals of the State into five regions, providing quality healthcare to the Neighbor Island communities, thereby greatly enhancing the inter- and intra-regional operational support and fiscal efficiency of those hospitals. All HHSC hospitals are fully licensed and certified or accredited by a state or federal accrediting organization.

Critical Access Hospital (CAH)

A critical access hospital (CAH) is a small, rural hospital considered critical to providing access to medical care to the populations they serve. These hospitals have less than 25 acute care beds and must maintain 24-hour emergency departments. Because these hospitals are considered critical for maintaining the rural health safety net, they receive cost-based reimbursement from Medicare.

Table 4: Hawai‘i Health Systems Corporation (HHSC) and Critical Access Hospital

County	HHSC Hospitals	Critical Access Hospitals
Hawai‘i	Kohala Hospital Hale Ho‘ōla Hāmākua Ka‘ū Hospital Kona Community Hospital Hilo Medical Center	Kohala Hospital Hale Ho‘ōla Hāmākua Ka‘ū Hospital
Honolulu	Kahuku Medical Center Leahi Hospital Maluhia	Kahuku Medical Center
Kaua‘i	West Kaua‘i Medical Center Samuel Mahelona Medical Center	West Kaua‘i Medical Center Samuel Mahelona Medical Center
Maui	Maui Memorial Medical Center Kula Hospital Lāna‘i Community Hospital	Kula Hospital Lāna‘i Community Hospital Moloka‘i General Hospital



Map 7: Location of Hawai'i Health Services Corporation and Critical Access Hospitals

Table 5: Medically Underserved Area/Population and Health Professional Shortage Area Designations by Area, Type, Score, and Designation Date (as of July 2009)

Area	Medically Underserved Area/Population	Primary Care HPSA	Dental HPSA	Mental Health HPSA	Date of Last HPSA Update		
					Primary Care	Dental	Mental Health
(Census Tract)	Designations/Scores						
Hawai'i County							
Hawai'i County	MUP		** 12			6-Jun	
Puna (210.01-211)		* (211) 14		* 16	6-Sep		7-Aug
Ka'ū (212)		* 17		* 12	6-Aug		6-Aug
Waikoloa (217.01)		* 8			6-Sep		
North Hawai'i (219-221)				** 9			7-Aug
Honolulu County							
Waikīkī (18.01-20.02)	GOV MUP						
Kalihi-Pālana (51-62.02)	GOV MUP		** 7			5-Nov	
Kalihi Valley (63.01-66)	MUA		** 7			5-Nov	
Wai'anae (96.01-98.01)	MUA						
Ko'olauloa (101-102.02)	MUA						
North Shore (99.01-102.02)				**10			9-Feb
Waimānalo (113.01-113.02)	GOV MUP						
Kaua'i County							
Kaua'i County	GOV MUP			* (408–409) 8			7-Nov
Maui County							
Hana/Ha'ikū (301-302)	GOV MUP	*14	**18	* (301) 10	6-Sep	8-Apr	6-Sep
Maui (303.01-315)	MUP		* 12			9-Mar	
Lāna'i Island (316)	MUP						
Moloka'i Island (317-319)	MUA	*10	**12	* 17	8-Nov	8-Apr	7-Aug
Kalawao County							
Kalawao County (319)	MUA			* 17			7-Aug

MUA — Medically Underserved Area

MUP — Medically Underserved Population

HPSA — Health Professional Shortage Area

GOV MUP — Medically Underserved Area requested by Governor

* — Approved as an Area designation

** — Approved as a Population designation

Table 6: Automatic Facility HPSA Scores by Area, Type, and Classification (as of July 2009)

Facility	Primary Care Designation Score	Dental Health Designation Score	Mental Health Designation Score	Facility Classification
Hawai'i County				
Bay Clinic	17	21	11	CHC
Hāmākua Health Center	5	8	10	CHC
Hui Malama Ola Na 'Oiwi	10	0	0	CHC
West Hawai'i Health Center	4	6	8	CHC
Honolulu County				
Kalihi-Pālama Health Center	10	10	10	CHC
Kōkua Kalihi Valley	10	10	10	CHC
Ko'olauloa Health and Wellness Center	18	24	16	CHC
Papa Ola Lokahi	0	0	0	FQHC-LA
Wai'anae Coast Comprehensive Health Center	7	11	17	CHC
Waikīkī Health Center	6	10	10	CHC
Waimānalo Health Center	7	10	9	CHC
Federal Detention Center Honolulu	21	21		Correctional
Hālawā Correctional Facility	9	15	9	Correctional
Women's Community Correctional Center	9	9	9	Correctional
Kaua'i County				
Ho'ola Lahui Hawai'i/Kaua'i Community Health Center	5	10	10	CHC
Maui County				
Community Clinic of Maui	14	6	13	CHC
Hāna Community Health Center	5	5	18	CHC
Hui no ke Ola Pono	0	0	0	CHC
Lāna'i Community Health Center	6	0	0	CHC
Moloka'i 'Ohana Health Care	5	10	18	CHC
Moloka'i General Hospital	5		18	RHC
Na Pu'uwai	0	0	0	CHC

CHC — Comprehensive Health Center

FQHC-LA—Federally Qualified Health Center Look-A-Like

HPSA — Health Professional Shortage Area

RHC — Rural Health Clinic

Note: Automatic Facility HPSA Scores may be subject to change. Check for updated scores at <http://hpsafind.hrsa.gov/HPSASearch.aspx> (under "Type" choose the type of facility)

Clinics may use the higher of their parent site's Automatic Facility Score or the geographic or population group score for the Census Tract in which they are located (see Table 5)

CHAPTER 3: POPULATION AND SOCIO-ECONOMIC STATUS

Population level factors often contribute to disparities in health with significantly higher risks in most adverse outcomes among those living in poverty, some racial/ethnic groups, those with low education and with other factors. This chapter was developed to highlight many of the key population and socio-economic indicators that may be related to the health disparities observed between populations. Some of these indicators were combined into a summary measure referred to as the socio-economic risk index and presented in Table 7, Table 8, and in Map 8.

POPULATION STATUS INDICATORS

The population status indicators are defined as follows:

Total Number of Residents	=	Number of resident population in each area
Percent of Population 17 Years of Age and Below	=	$\frac{\text{Number of persons 17 years of age and below}}{\text{Total population}} \times 100$
Percent of Population 65 Years of Age and Over	=	$\frac{\text{Number of persons 65 years of age and over}}{\text{Total population}} \times 100$
Birth Rate for Women 18 to 44 Years of Age*	=	$\frac{\text{Number of births to women 18 to 44 years of age}}{\text{Total number of women 18 to 44 years of age}} \times 100$
Percent of Population that are Native Hawaiian	=	$\frac{\text{Number of Native Hawaiians (alone or in combination) in each service area}}{\text{Total number of persons in each service area}} \times 100$
Percent of Population that are Filipino	=	$\frac{\text{Number of Filipinos (alone or in combination) in each service area}}{\text{Total number of persons in each service area}} \times 100$

* Birth Rate for Women 18 to 44 Years of Age

The birth rate for adult women 18 to 44 years of age was based on estimates of births in 2008 from the State of Hawai'i, Department of Health, Office of Health Status and Monitoring vital statistics and from the resident population in each area from the 2000 U.S. Census.

SOCIO-ECONOMIC STATUS INDICATORS

The socio-economic status indicators are defined as follows:

$$\text{Percentage of Population Below 100\% (or 200\%) of Federal Poverty Level} = \frac{\text{Number of persons with incomes below 100 percent (or 200 percent) of the federal poverty level}}{\text{Total population}} \times 100$$

$$\text{Per Capita Income} = \text{Annual income (U.S. dollars) per person}$$

$$\text{Percent of Civilian Labor Force Unemployed} = \frac{\text{Number of persons in civilian labor force unemployed}}{\text{Total civilian labor force}} \times 100$$

$$\text{Percent of Population 18 Years of Age and Older with No High School Diploma} = \frac{\text{Number of persons 18 years of age and over with no high school diploma}}{\text{Total population 18 years of age and over}} \times 100$$

$$\text{Percent of Households Receiving Financial Aid} = \frac{\text{Number of households receiving financial aid under Temporary Assistance to Needy Families (TANF)}}{\text{Total number of households}} \times 100$$

$$\text{Percent of Households Receiving Food Stamps} = \frac{\text{Number of households receiving food stamps}}{\text{Total number of households}} \times 100$$

Data was purchased from Claritas by the Primary Care Office to obtain estimates on per capita income by primary care service area.

Data from the Research and Statistics Office, Hawai'i Department of Labor and Industrial Relations and the Information Systems Office, Hawai'i Department of Human Services were used for the other socio-economic status indicators.

RACIAL POPULATION FIGURES UPDATE

Due to the growing changes in the racial and ethnic makeup of the country and in order to collect data that would better reflect the diversity of the country's population, the U.S. Census Bureau modified the way they collected race data in the year 2000 Census. Respondents were allowed to identify one or more races to indicate their racial identity. There were 15 check box response categories and three write-in areas on the Census 2000 questionnaire, compared with 16 check box response categories and two write-in areas for the 1990 Census. Consequently, data on race from the 2000 Census are not directly comparable with those from the 1990 Census and previous censuses due, in part, by allowing respondents the option to report more than one race. Due to the change, data on race can be presented using several different options. The following example from the 2000 U.S. Census Population Report¹: illustrates the differences in two groups generally considered at increased risk when the Native Hawaiian or Filipino races are presented "alone" or in "combination with one or more other races."

	State of Hawai'i	Hawai'i County	Honolulu County	Kaua'i County	Maui County
Native Hawaiian Alone	80,137	14,461	49,267	4,935	11,410
Native Hawaiian Alone or in Any Combination	239,655	43,010	153,117	13,511	30,017
Filipino Alone	170,635	13,551	124,072	11,195	21,804
Filipino Alone or in Any Combination	275,728	31,354	191,393	18,522	34,445

Of the Native Hawaiian population living in Hawai'i, there were 239,655 who were identified as Native Hawaiian alone or in combination with one or more of the other races. The almost three-fold increase in the numbers of Native Hawaiian population for the State reflects the multi-racial identity of the population in Hawai'i by including those that are sometimes reported as "part-Hawaiian". We see similar changes with the Filipino population with 275,728 identified as Filipino alone or in combination with one or more of the other races representing a 1.6 fold increase in numbers when those that could be reported as part-Filipino or "multirace" are included. Those who report their race "alone or in any combination" is likely more indicative of the Native Hawaiian and Filipino people living in the State of Hawai'i and will be presented by primary care service area in this data book.

Due to data suppression standards for the U.S. Census bureau (e.g., cell sizes < 100), the number of residents for each census tract and county were obtained and depicted in the tables and charts. Consequently, the summation of individual primary care service areas (based on census tract clusters) for a particular county may differ slightly from the number listed overall for the county.

The focus of this report is to identify overall community risks and it is hoped that showing a brief overview of various race/ethnic groups may provide assistance in planning for primary care needs. It is important to consider that disparities seen in health are complex in nature and may be related to age, gender, race/ethnicity, socio-economic conditions, and other factors so a comprehensive approach is needed to improve health and address disparities.

¹ U.S. Census Bureau. Census 2000 Summary File (SF2) 100-Percent Data. Available online at <http://factfinder.census.gov>

Chart 2: Total Number of Residents, 2000

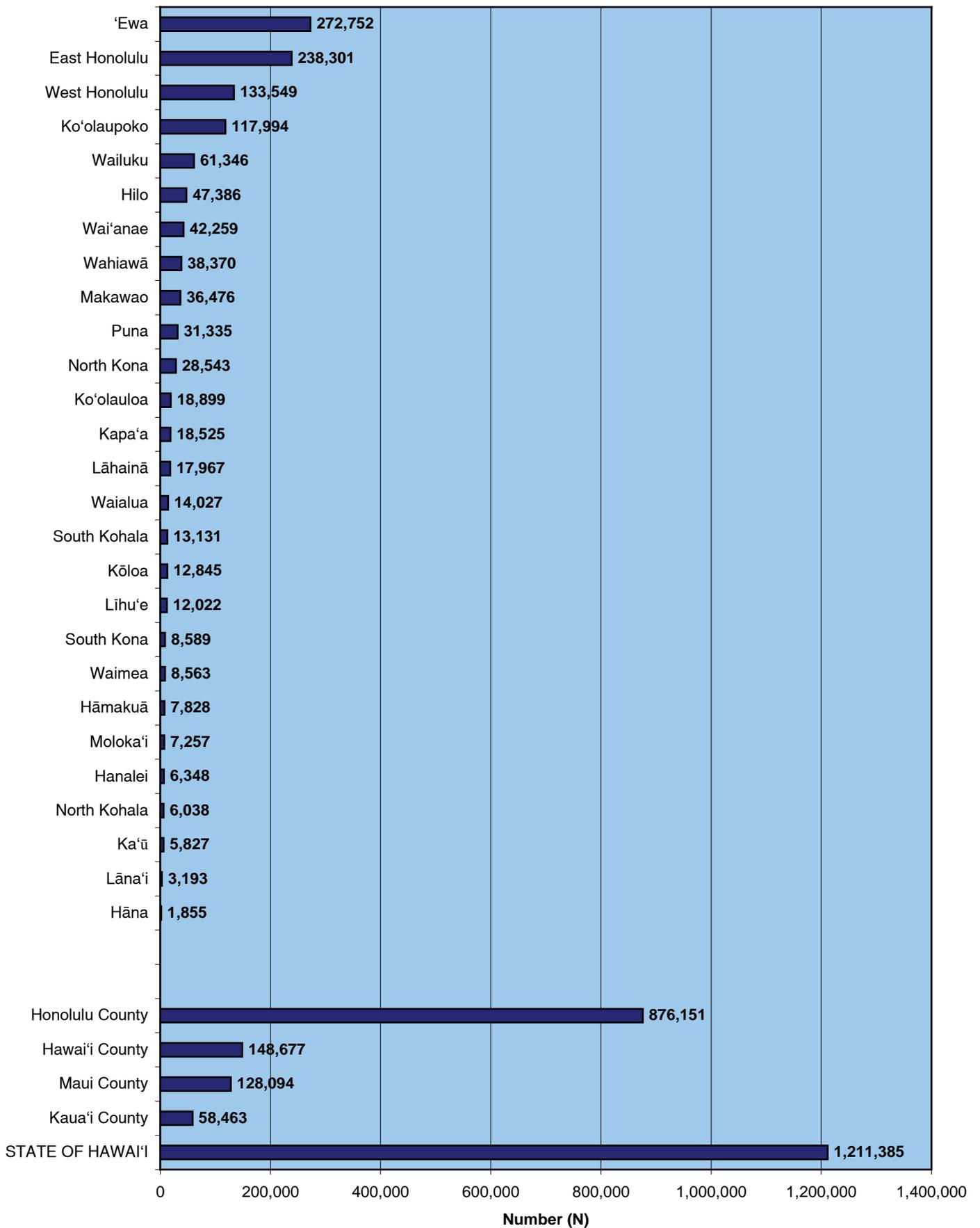


Chart 3: Percent of Population 17 Years of Age and Below, 2000

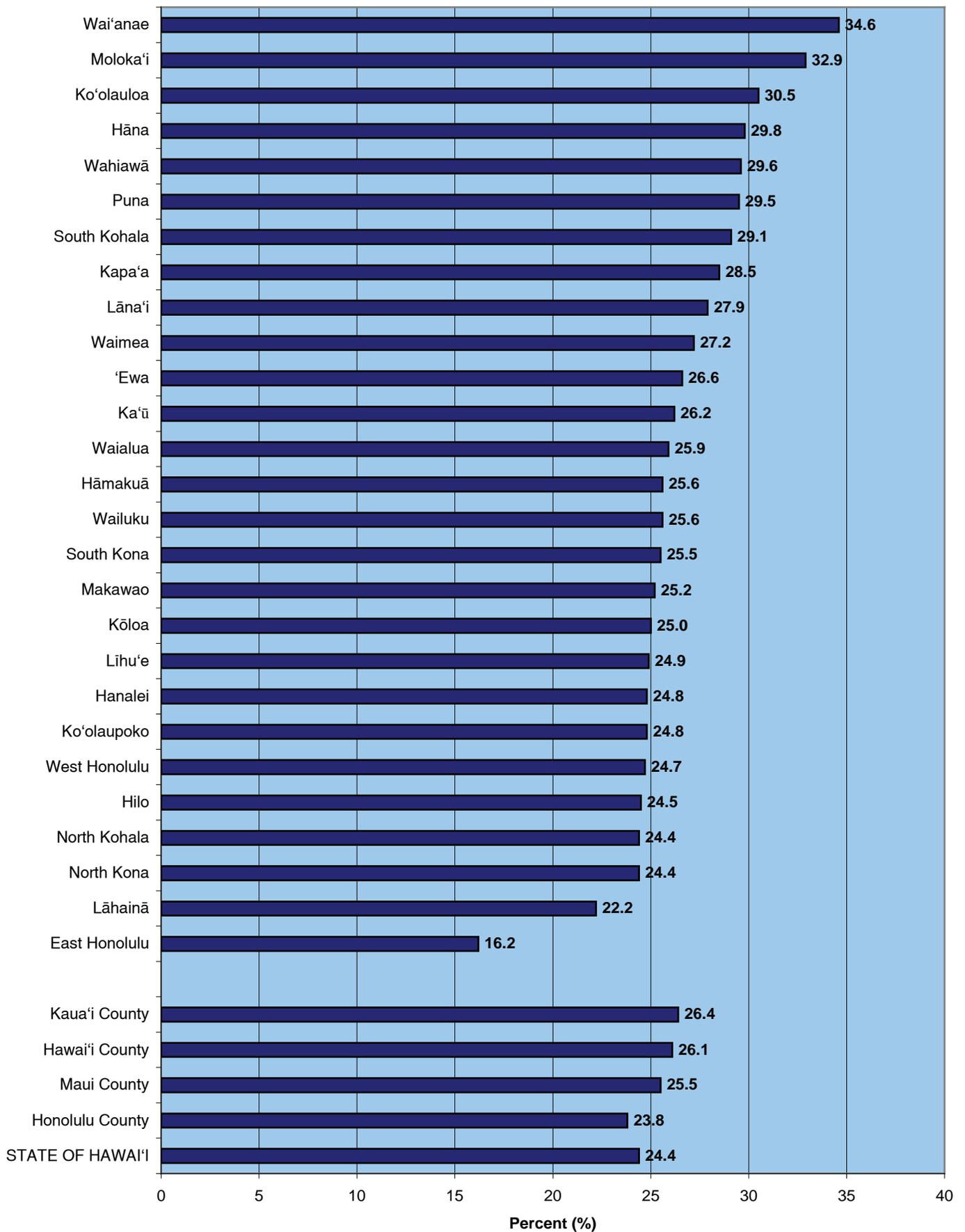


Chart 4: Percent of Population 65 Years of Age and Over, 2000

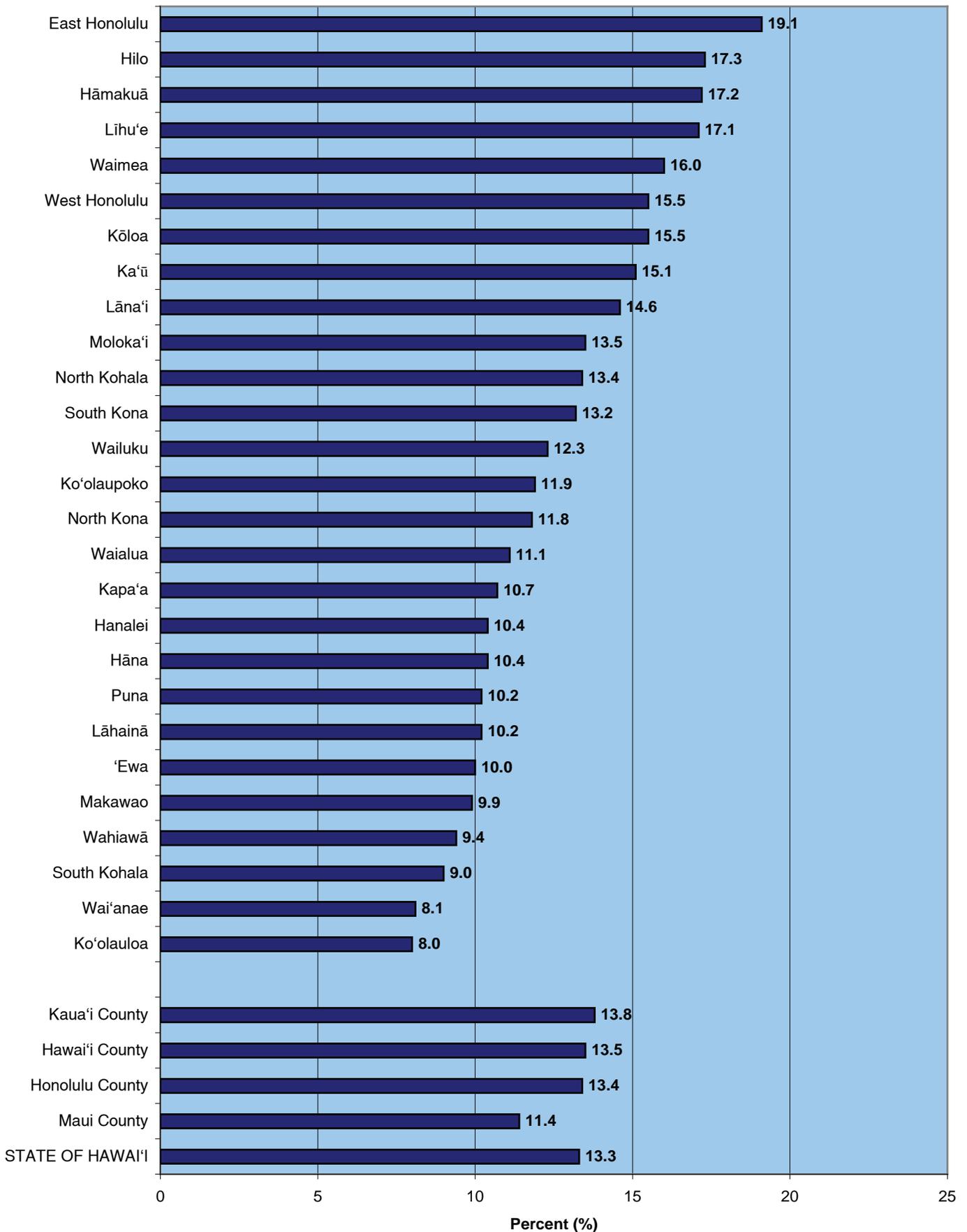


Chart 5: Estimated Birth Rate of Women 18 to 44 Years of Age, 2000



Chart 6: Number of Native Hawaiians (alone or in any combination), 2000

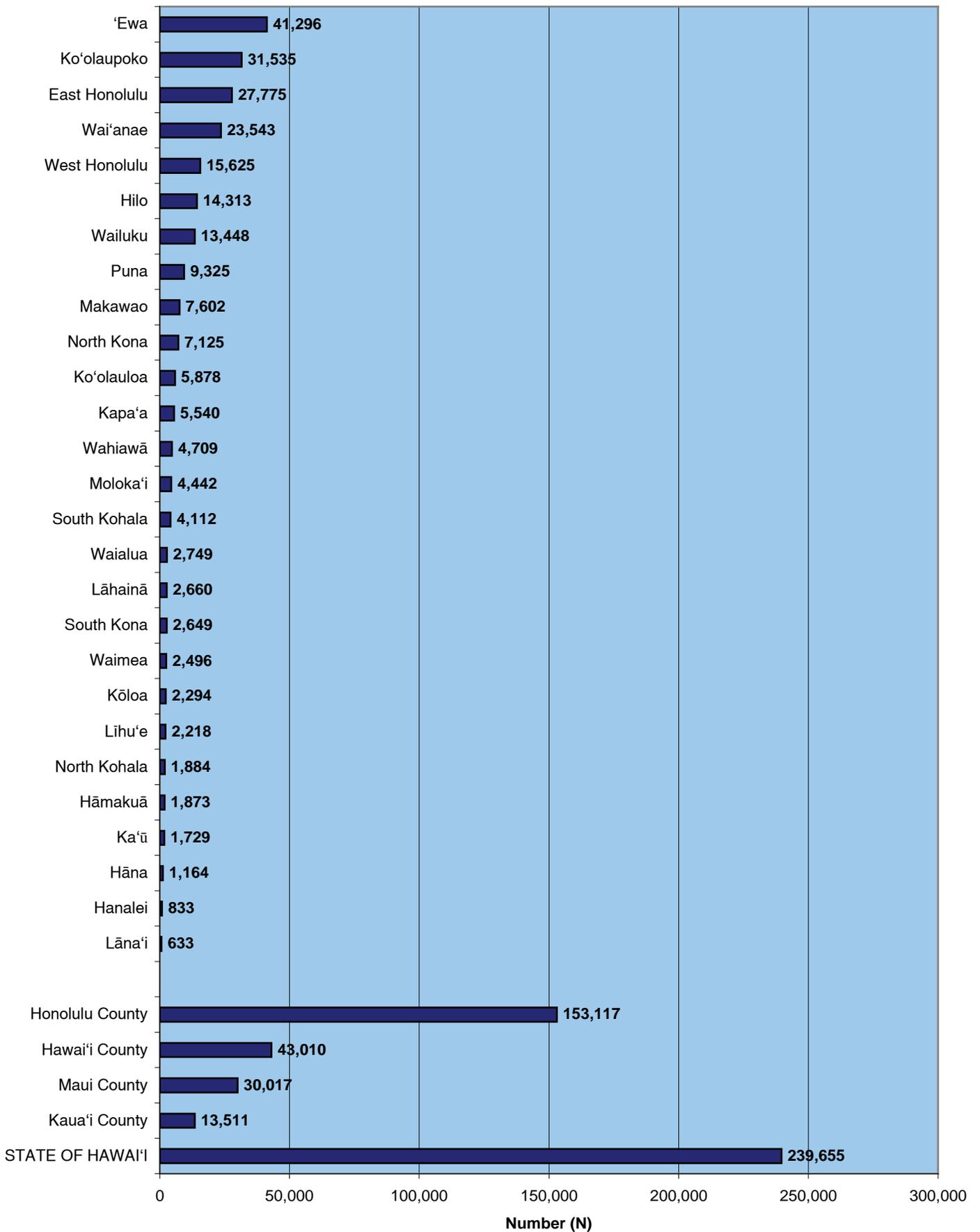


Chart 7: Percent of Population that are Native Hawaiian (alone or in any combination), 2000

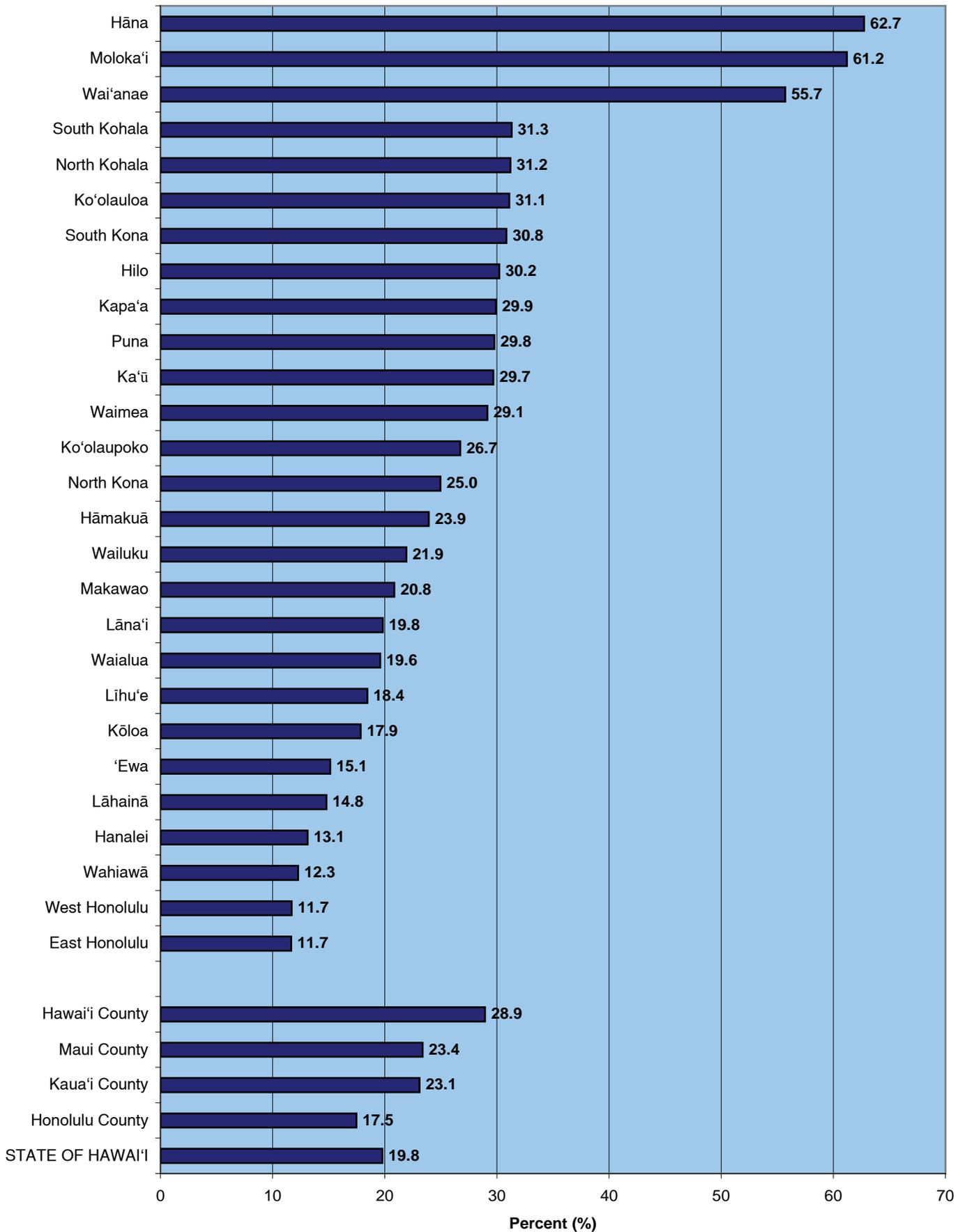


Chart 8: Number of Filipinos (alone or in any combination), 2000

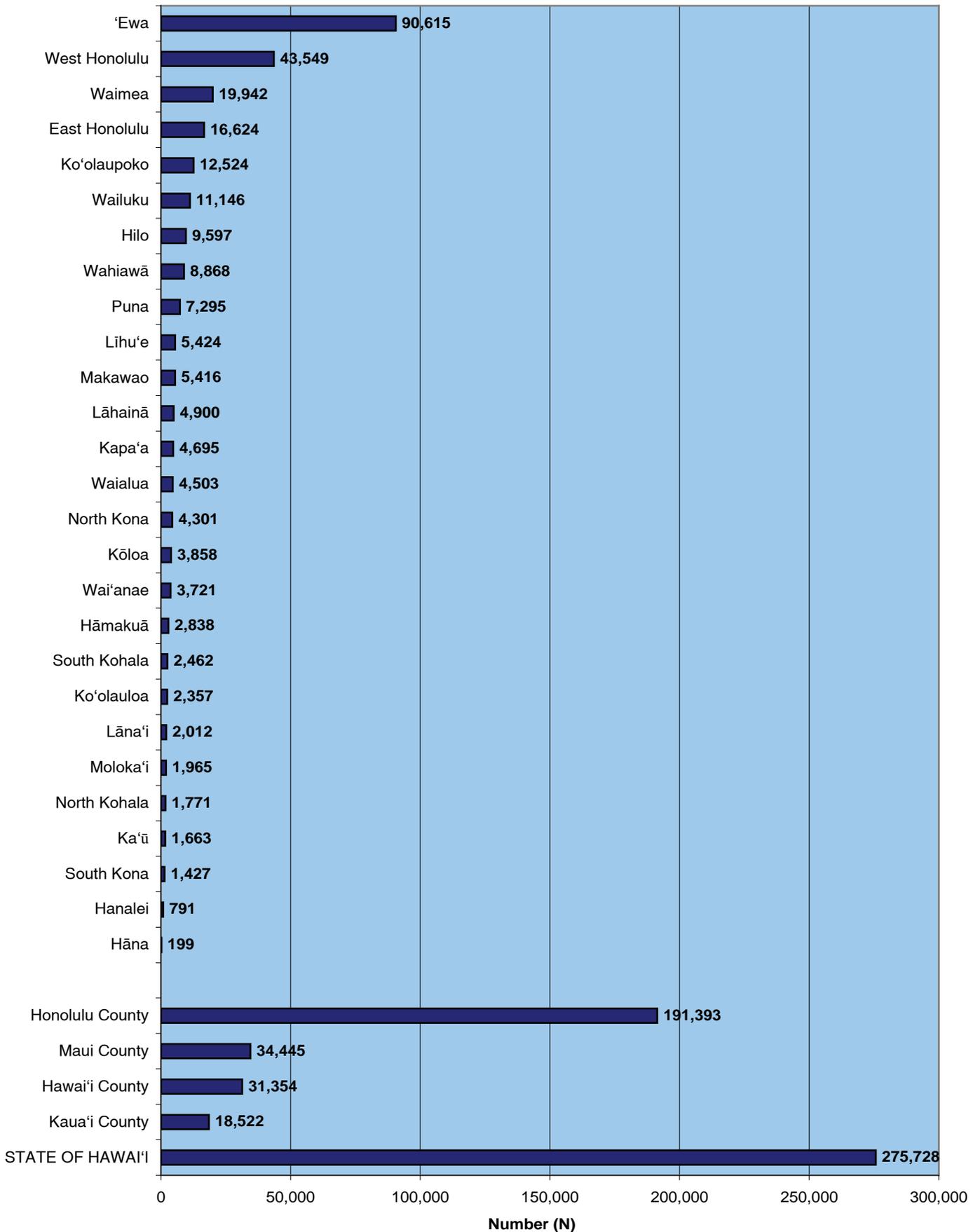


Chart 9: Percent of Population that are Filipino (alone or in any combination), 2000

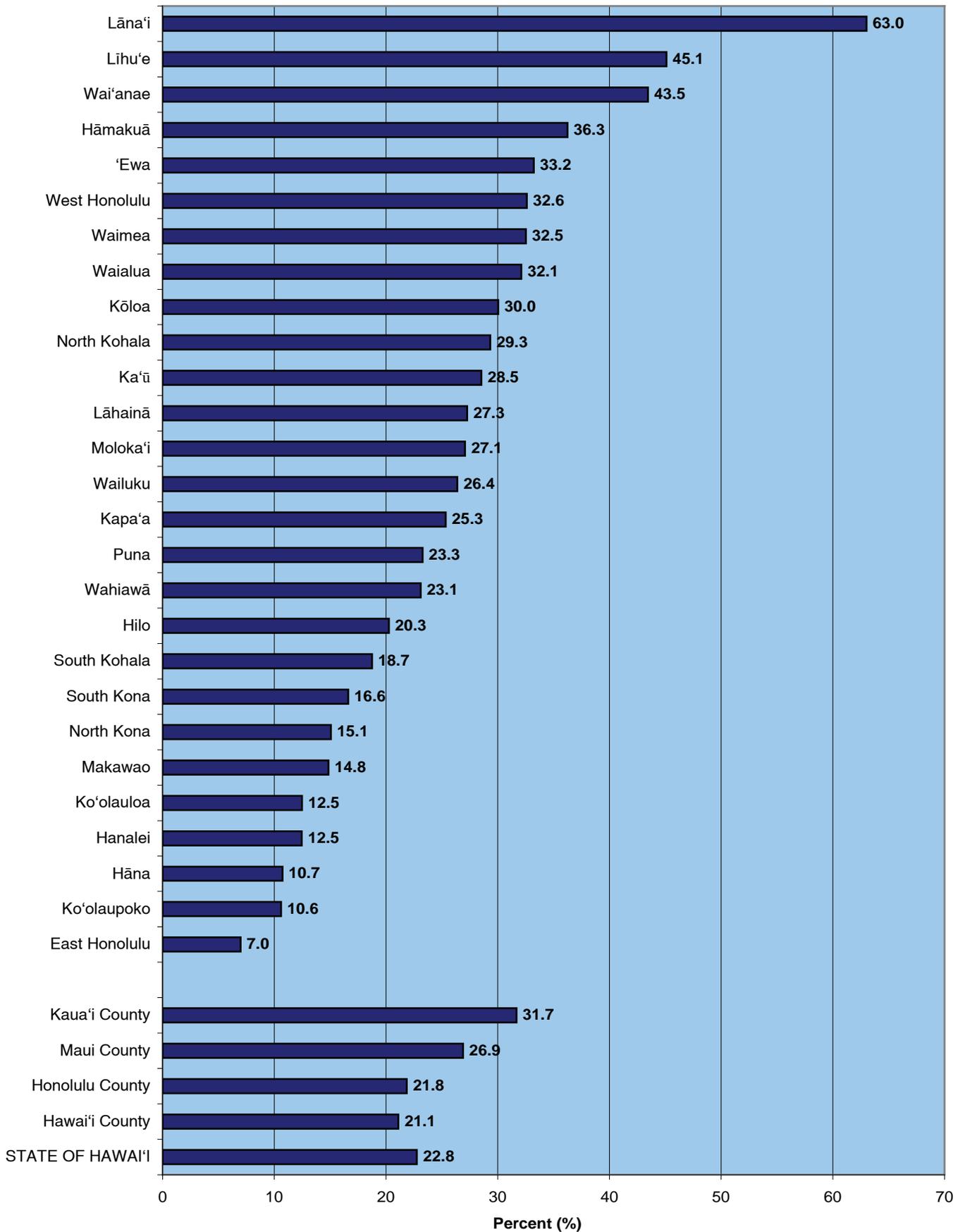


Chart 10: Percent of Population Below 100% of Federal Poverty Level, 2000

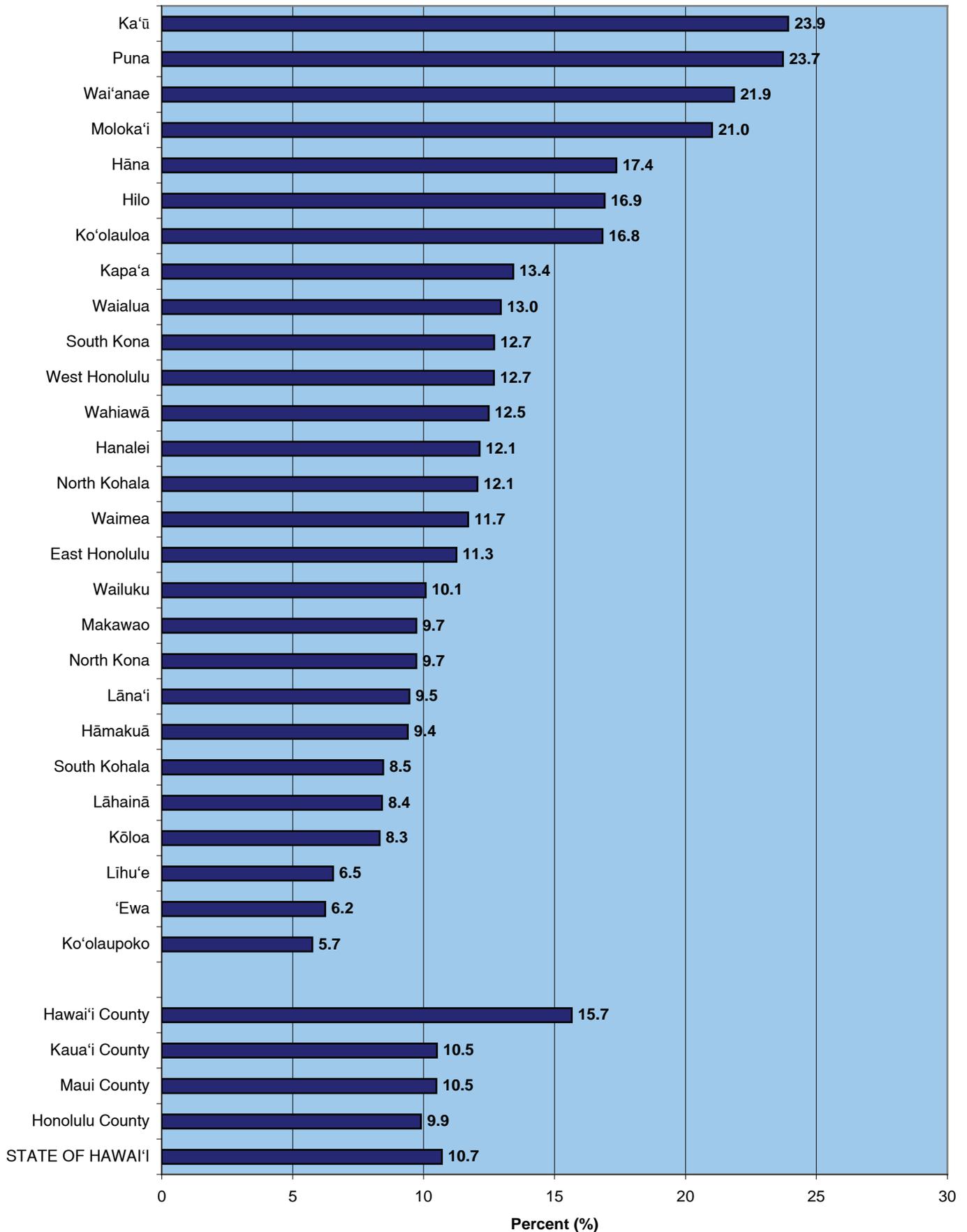


Chart 11: Percent of Population Below 200% of Federal Poverty Level, 2000

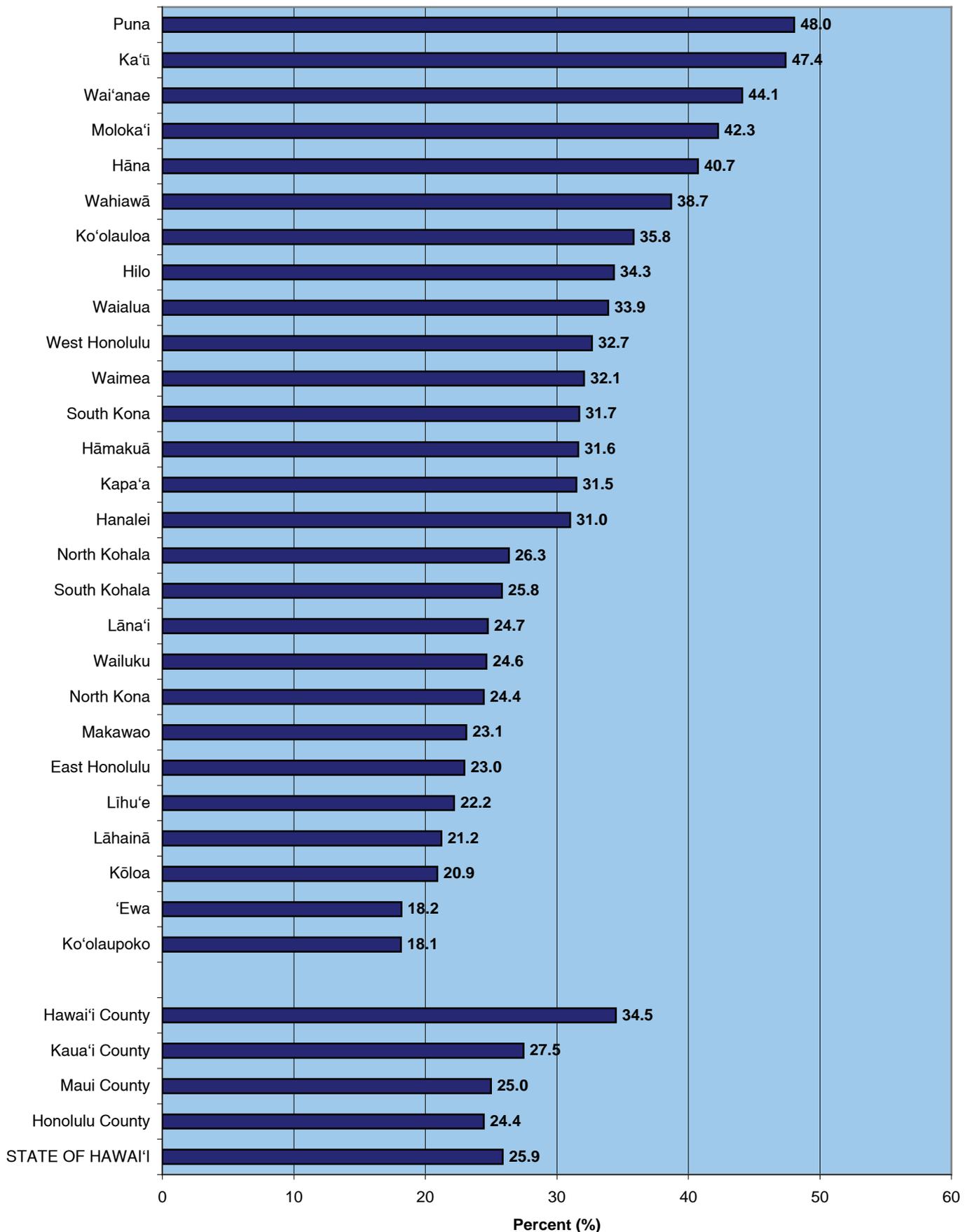


Chart 12: Per Capita Income, 1998

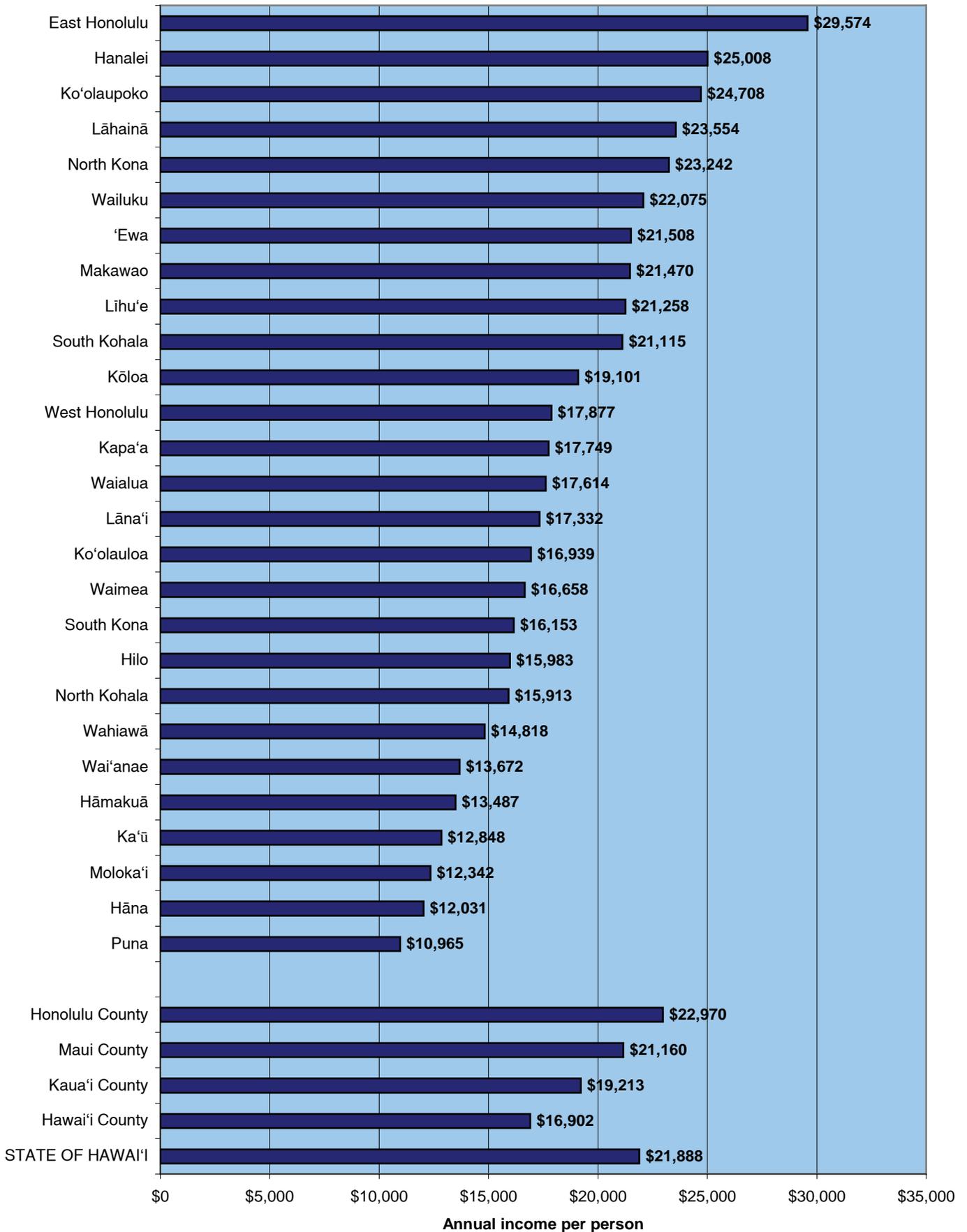


Chart 13: Percent of Civilian Labor Force Unemployed, 2008

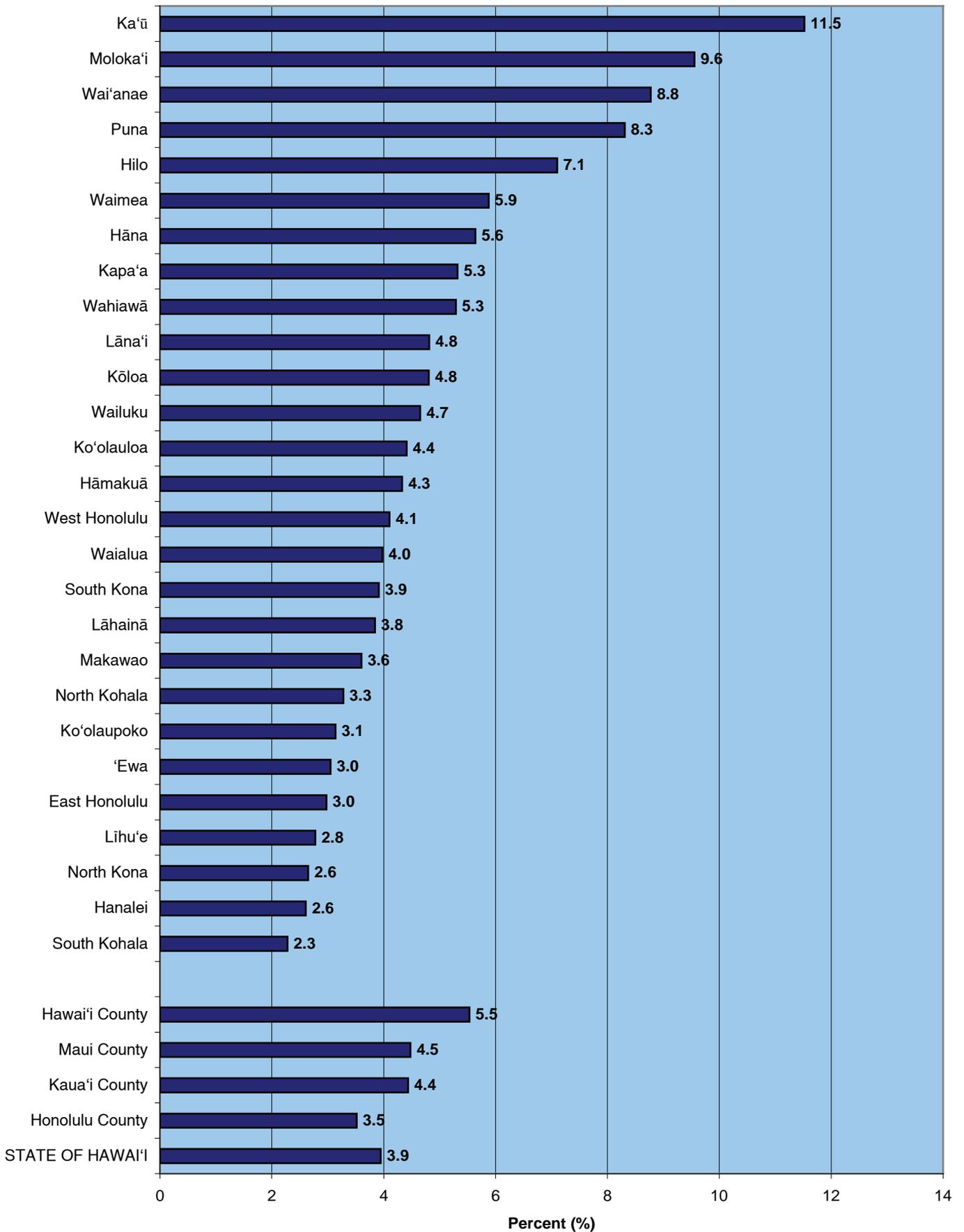


Chart 14: Percent of Population 18 Years of Age and Over with No High School Diploma, 2000

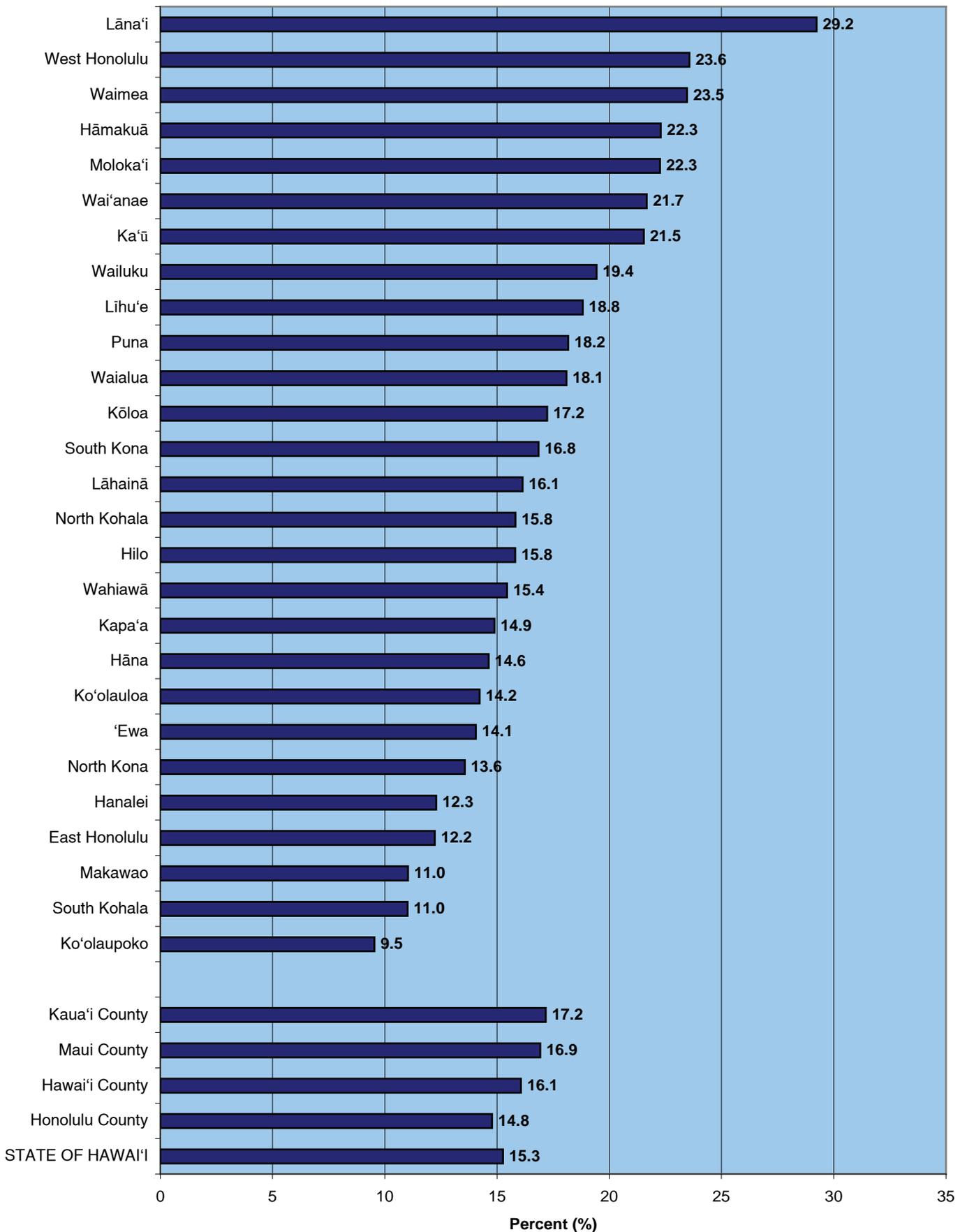


Chart 15: Percent of Households Receiving Financial Aid (TANF/TANOF), 2008

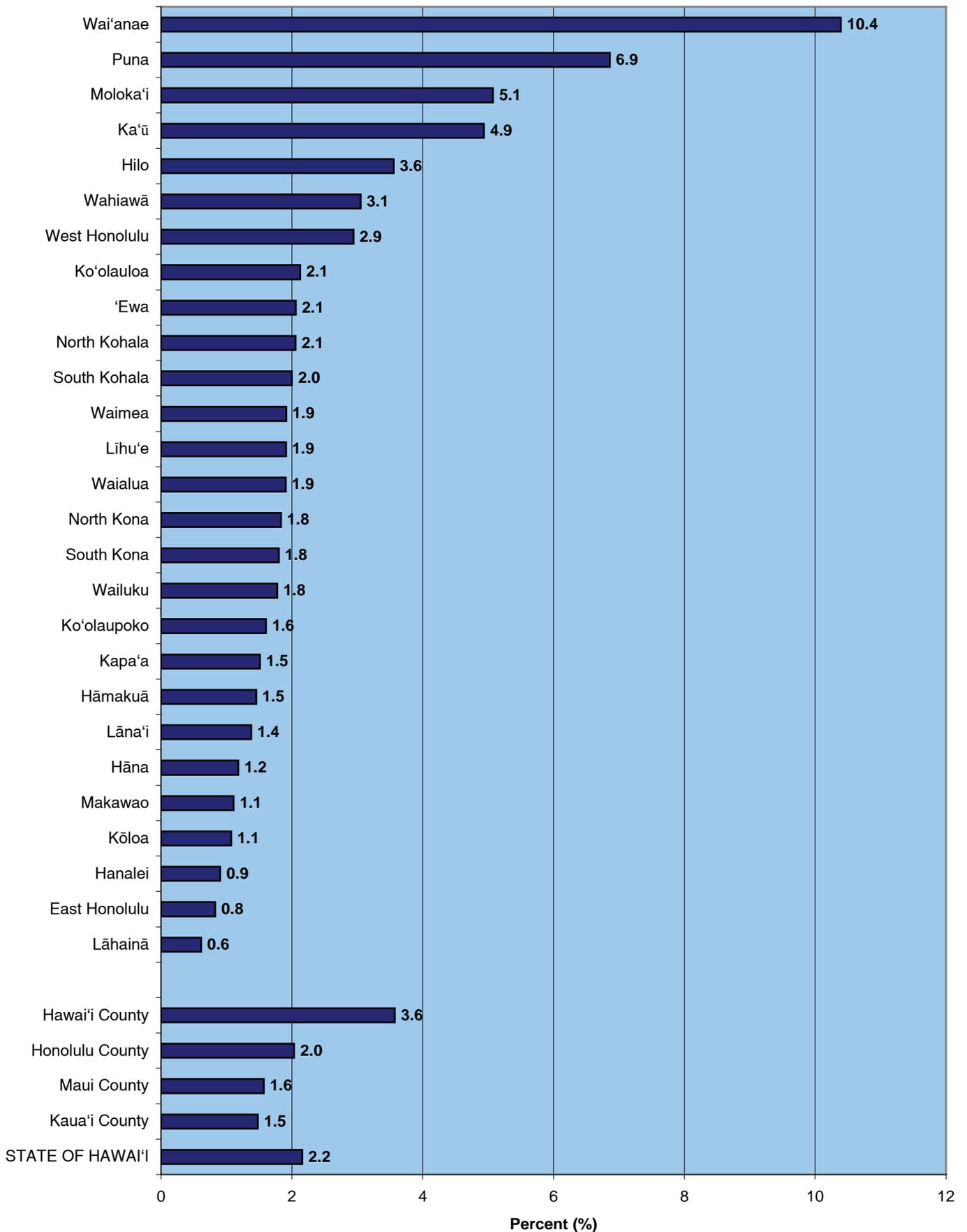


Chart 16: Percent of Households Receiving Food Stamps, 2008

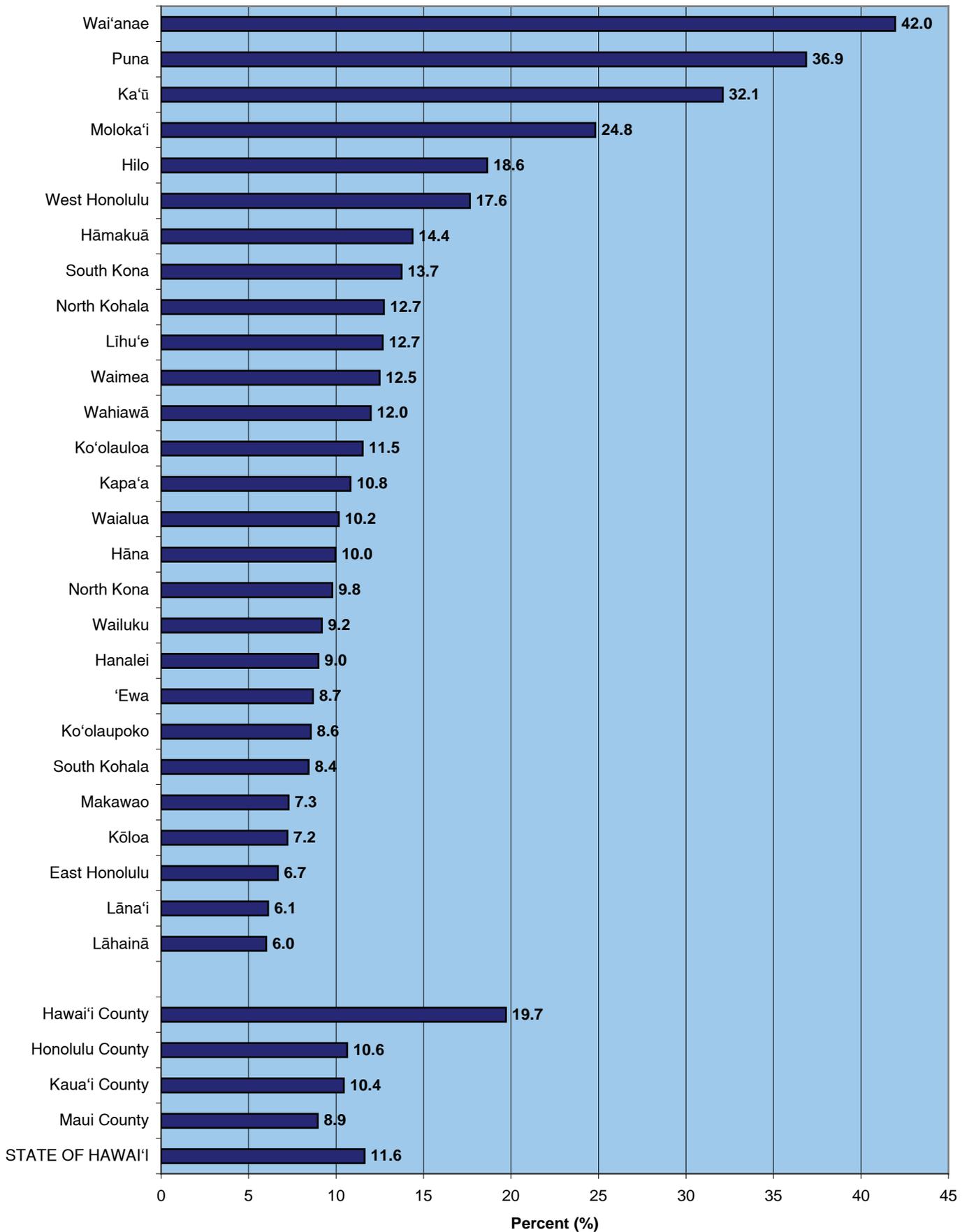
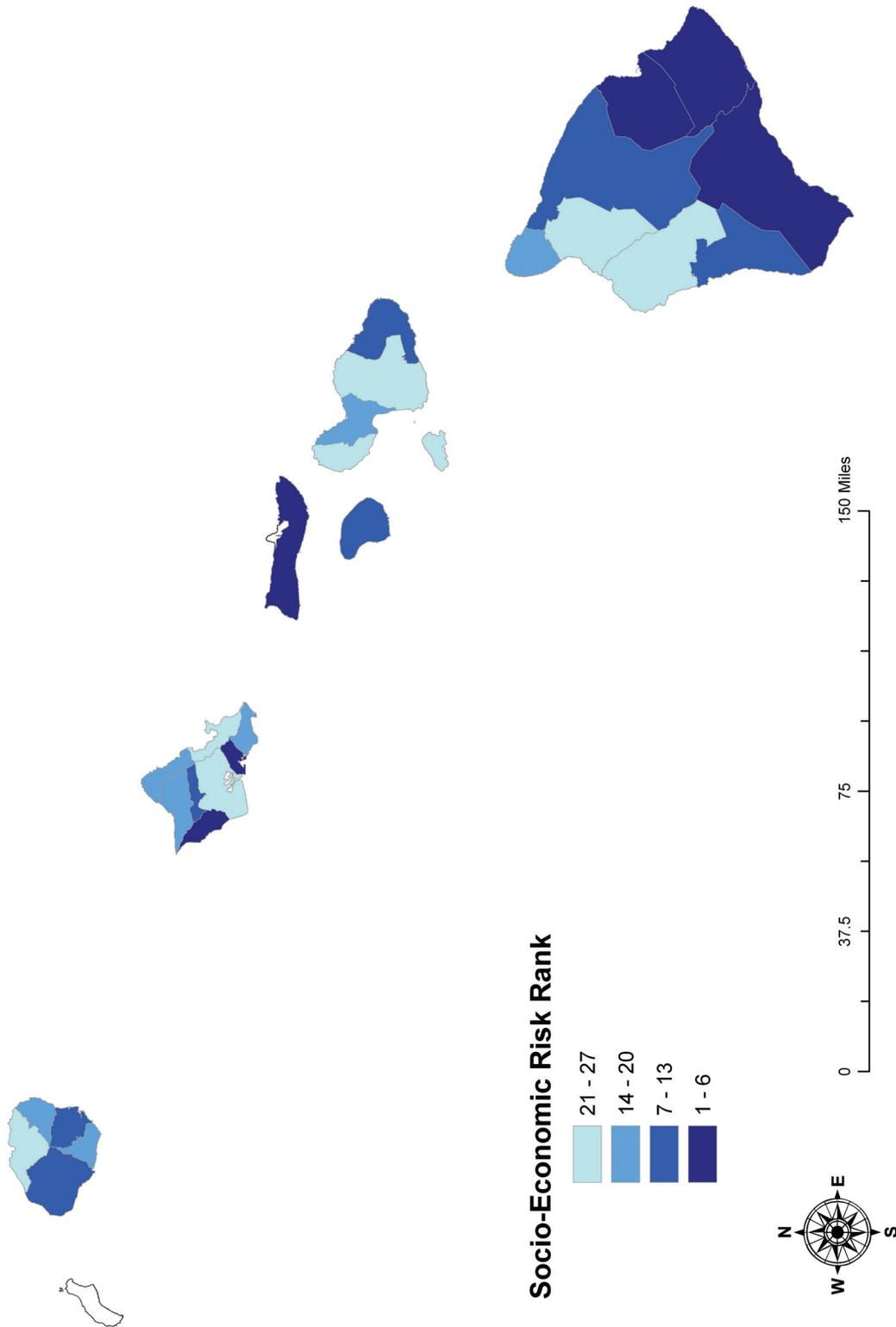


Table 7: Summary of Indicators for Socio-Economic Risk Index, 2000, 2008

	Percent of Population 65 Years of Age and Over (2000) (%)	Percent of Population <200 of Federal Poverty Level (2000) (%)	Percent of Civilian Labor Force Unemployed (2008) (%)	Percent of Adults with No High School Diploma (2000) (%)	Percent of Households Receiving Financial Aid) (2008) (%)	Percent of Households Receiving Food Stamps (2008) (%)
State of Hawai'i	13.3	25.9	3.9	15.3	2.2	11.6
Honolulu County	13.4	24.4	3.5	14.8	2.0	10.6
East Honolulu	19.1	23.0	3.0	12.2	0.8	6.7
West Honolulu	15.5	32.7	4.1	23.6	2.9	17.6
'Ewa	10.0	18.2	3.0	14.1	2.1	8.7
Wahiawā	9.4	38.7	5.3	15.4	3.1	12.0
Wai'anae	8.1	44.1	8.8	21.7	10.4	42.0
Waialua	11.1	33.9	4.0	18.1	1.9	10.2
Ko'olauloa	8.0	35.8	4.4	14.2	2.1	11.5
Ko'olaupoko	11.9	18.1	3.1	9.5	1.6	8.6
Hawai'i County	13.5	34.5	5.5	16.1	3.6	19.7
Hilo	17.3	34.3	7.1	15.8	3.6	18.6
Puna	10.2	48.0	8.3	18.2	6.9	36.9
Ka'ū	15.1	47.4	11.5	21.5	4.9	32.1
South Kona	13.2	31.7	3.9	16.8	1.8	13.7
North Kona	11.8	24.4	2.6	13.6	1.8	9.8
South Kohala	9.0	25.8	2.3	11.0	2.0	8.4
North Kohala	13.4	26.3	3.3	15.8	2.1	12.7
Hāmakuā	17.2	31.6	4.3	22.3	1.5	14.4
Maui County	11.4	25.0	4.5	16.9	1.6	8.9
Hāna	10.4	40.7	5.6	14.6	1.2	10.0
Makawao	9.9	23.1	3.6	11.0	1.1	7.3
Wailuku	12.3	24.6	4.7	19.4	1.8	9.2
Lāhainā	10.2	21.2	3.8	16.1	0.6	6.0
Lāna'i	14.6	24.7	4.8	29.2	1.4	6.1
Moloka'i	13.5	42.3	9.6	22.3	5.1	24.8
Kaua'i County	13.8	27.5	4.4	17.2	1.5	10.4
Hanalei	10.4	31.0	2.6	12.3	0.9	9.0
Kapa'a	10.7	31.5	5.3	14.9	1.5	10.8
Līhu'e	17.1	22.2	2.8	18.8	1.9	12.7
Kōloa	15.5	20.9	4.8	17.2	1.1	7.2
Waimea	16.0	32.1	5.9	23.5	1.9	12.5

Table 8: Ranking Based on Socio-Economic Risk Index

Ranking of Service Areas by County			State-Wide Ranking of Service Areas		
Service Area	Risk Rank	Risk Score	Service Area	Risk Rank	Risk Score
Honolulu County <i>(highest)</i>			State of Hawai'i <i>(highest)</i>		
Wai'anae	1	9.4	Ka'ū	1	9.6
West Honolulu	2	2.8	Wai'anae	2	9.4
Wahiawā	3	-0.3	Puna	3	7.4
Waialua	4	-1.0	Moloka'i	4	7.1
Ko'olaupoko	5	-2.2	Hilo	5	3.6
East Honolulu	6	-2.3	West Honolulu	6	2.8
'Ewa	7	-4.5	Waimea	7	2.6
Ko'olaupoko	8	-5.1	Hāmakuā	8	2.0
<i>(lowest)</i>			Lāna'i	9	1.1
Hawai'i County <i>(highest)</i>			Wahiawā	10	-0.3
Ka'ū	1	9.6	Līhu'e	11	-0.5
Puna	2	7.4	South Kona	12	-0.6
Hilo	3	3.6	Hāna	13	-0.9
Hāmakuā	4	2.0	Waialua	14	-1.0
South Kona	5	-0.6	Wailuku	15	-1.3
North Kohala	6	-1.6	North Kohala	16	-1.6
North Kona	7	-3.5	Kōloa	17	-1.6
South Kohala	8	-5.0	Kapa'a	18	-1.7
<i>(lowest)</i>			Ko'olaupoko	19	-2.2
Maui County <i>(highest)</i>			East Honolulu	20	-2.3
Moloka'i	1	7.1	North Kona	21	-3.5
Lāna'i	2	1.1	Hanalei	22	-4.0
Hāna	3	-0.9	Lāhainā	23	-4.3
Wailuku	4	-1.3	'Ewa	24	-4.5
Lāhainā	5	-4.3	South Kohala	25	-5.0
Makawao	6	-5.0	Makawao	26	-5.0
<i>(lowest)</i>			Ko'olaupoko	27	-5.1
Kaua'i County <i>(highest)</i>			<i>(lowest)</i>		
Waimea	1	2.6			
Līhu'e	2	-0.5			
Kōloa	3	-1.6			
Kapa'a	4	-1.7			
Hanalei	5	-4.0			
<i>(lowest)</i>					



Map 8: Socio-Economic Risk Index by Primary Care Service Area

CHAPTER 4: MATERNAL AND INFANT HEALTH

Maternal and infant health status indicators are often used as a measure of overall community health. This chapter was developed to highlight many of the key maternal and infant health status indicators that related to the health disparities observed between populations. These indicators were combined into a summary measure referred to as the maternal and infant health risk index and presented in Table 14, Table 15, and in Map 9.

MATERNAL AND INFANT HEALTH STATUS INDICATORS

The health status indicators are defined as follows:

$$\text{Infant Mortality Rate (IMR)} = \frac{\text{Number of infant deaths}}{\text{Total number of live births}} \times 1,000$$

$$\text{Percent of Births with Less Than Adequate Prenatal Care Utilization}^* = \frac{\text{Number of births to mothers who received less than adequate prenatal care}}{\text{Total number of live births}} \times 100$$

$$\text{Percent of Births with Low Birth Weight} = \frac{\text{Number of births with weight less than 2,500 grams}}{\text{Total number of live births}} \times 100$$

$$\text{Percent of Births to Teens 10 to 17 Years of Age} = \frac{\text{Number of births to mothers 10 to 17 years of age}}{\text{Total number of live births}} \times 100$$

$$\text{Percent of Births to Mothers with Pre-Existing Medical Conditions}^{**} = \frac{\text{Number of births with pre-existing medical conditions}}{\text{Total number of live births}} \times 100$$

Vital Statistics Data

The Birth Certificate data includes characteristics about the infant such as date of birth, age, gender, race/ethnicity, place of birth, birth weight, weeks of gestation; and demographic information about the parents such as age, race/ethnicity, marital status, maternal and paternal education, place of residence; medical and health information such as prenatal care, number of prenatal visits, method of delivery, congenital anomalies, medical risks, obstetric procedures, complications.

* Percent of Births with Less Than Adequate Prenatal Care Utilization

In 1994, Milton Kotelchuck proposed the Adequacy of Prenatal Utilization Index (APNCU), more commonly referred to as the “Kotelchuck Index.”¹ The APNCU Index combines two separate indices: the “adequacy of initiation of prenatal care,” information on the adequacy of initiation of prenatal care (month care began) and the “adequacy of received services,” (number of visits based on gestational age of the child) to characterize adequacy of pregnancy-related health services provided to an expectant mother between conception and delivery. Rates are classified as “adequate plus,” “adequate,” “intermediate,” or “inadequate.”

The Adequacy of Prenatal Utilization Index offers a more accurate and comprehensive set of measures of prenatal care use than just the trimester of prenatal care initiation. The APNCU Index is the prenatal care utilization index now being actively supported by the Maternal and Child Health Bureau (MCHB), DHHS. Consequently, it is the index which the Family Health Services Division (FHSD) and other agencies are now required to use in their reporting. In this data book, the percentage of births with less than adequate prenatal care as defined in the APNCU Index will be shown by primary care service area.

**Percent of Births with mothers with pre-existing medical conditions

Births to mothers with pre-existing medical conditions may be associated with worse outcomes than those born to mothers without these conditions. In general women are delaying child birth to later years and this is coinciding with increases in chronic conditions (e.g., diabetes, high blood pressure) and their risk factors (e.g., obesity, physical inactivity) among women of reproductive age. This combination stresses the importance of obtaining and providing appropriate care before pregnancy, termed preconception and interconception care, to try and optimize the health of both the mother and the infant resulting from the pregnancy.²

This particular indicator was determined with the presence of the notation for any of the following pre-existing medical conditions collected in vital statistics data: anemia, cardiac disease, acute or chronic lung disease, diabetes, genital herpes, hydraminos/oligohydraminos, hemoglobinopathy, chronic hypertension, pregnancy-associated hypertension, eclampsia, incompetent cervix, previous infant 4000+ grams, previous preterm or small-for-gestational-age infant, renal disease, Rh sensitization, uterine bleeding, or infectious disease.

Healthy People 2010

The Healthy People 2010 objectives for infant mortality rate, inadequate prenatal care, teen birth rate, and low birth weight are included in the appropriate charts. *Healthy People 2010* are objectives developed by the U.S. Department of Health and Human Service and its agencies to improve the Nation's health. There are 467 objectives in 28 focus areas with baseline and measurable targets used to monitor progress toward its goals.³

1 Kotelchuck, M. 1994. *An Evaluation of the Kessner Adequacy of Prenatal Care Index and a Proposed Adequacy of Prenatal Care Utilization Index*. American Journal of Public Health. 84 (9): 1414-1420.

2 D'Angelo D, Williams L, Morrow B, Cox S, Harris N, Harrison L, Posner SF, Hood JR, Zapata L. 2007. *Preconception and interconception health status of women who recently gave birth to a live-born infant--Pregnancy Risk Assessment Monitoring System (PRAMS), United States, 26 reporting areas, 2004*. MMWR Surveillance Summary. 56(10):1-35.

3 U.S. Department of Health and Human Services. 2000. *Healthy People 2010: Understanding and Improving Health and Objectives for Improving Health*. 2nd edition. Washington, DC: U.S. Government Printing Office.

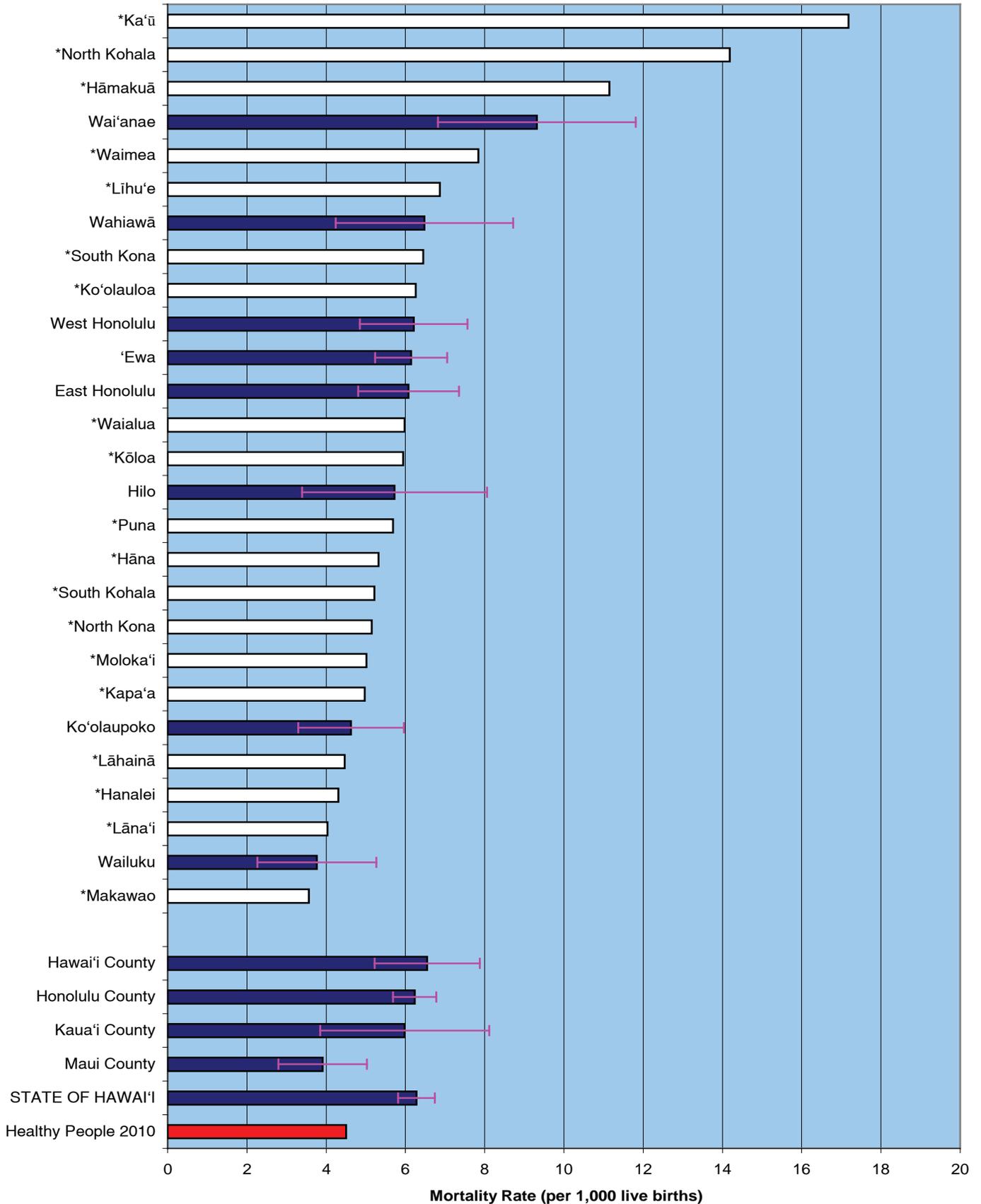
Table 9: Infant Mortality, 2003-2008

Service Area	Number of Live Births	Number of Infant Deaths	Infant Mortality Rate (IMR)	95% Confidence Interval
State of Hawai'i	111,964	703	6.3	(5.8-6.7)
Honolulu County	80,385	501	6.2	(5.7-6.8)
East Honolulu	14,311	87	6.1	(4.8-7.4)
West Honolulu	12,886	80	6.2	(4.9-7.6)
'Ewa	28,487	175	6.1	(5.2-7.1)
Wahiawā	4,939	32	6.5	(4.2-8.7)
Wai'anae	5,690	53	9.3	(6.8-11.8)
Waialua	1,672	10	6.0	---
Ko'olaupoko	2,237	14	6.3	---
Ko'olaupoko	9,941	46	4.6	(3.3-6.0)
Hawai'i County	14,203	93	6.5	(5.2-7.9)
Hilo	4,018	23	5.7	(3.4-8.1)
Puna	3,166	18	5.7	---
Ka'ū	582	10	17.2	---
South Kona	930	6	6.5	---
North Kona	2,912	15	5.2	---
South Kohala	1,533	8	5.2	---
North Kohala	423	6	14.2	---
Hāmakuā	628	7	11.1	---
Maui County	12,015	47	3.9	(2.8-5.0)
Hāna	188	1	5.3	---
Makawao	2,808	10	3.6	---
Wailuku	6,375	24	3.8	(2.3-5.3)
Lāhainā	1,792	8	4.5	---
Lāna'i	248	1	4.0	---
Moloka'i	598	3	5.0	---
Kaua'i County	5,016	30	6.0	(3.8-8.1)
Hanalei	464	2	4.3	---
Kapa'a	1,608	8	5.0	---
Līhu'e	1,164	8	6.9	---
Kōloa	1,010	6	5.9	---
Waimea	765	6	7.8	---

Source: State of Hawai'i, Department of Health, Office of Health Status Monitoring

No confidence intervals were computed when the number of events were less than 20. Instead, standardized ratios were computed and found to be less than 200, implying that the rates were not significantly higher than those for the State of Hawai'i. See Family Health Outcomes Project (FHOP), *Guidelines for Using Federal Data Templates with Small Numbers* (May 1, 1997).

Chart 17: Infant Mortality Rate, 2003-2008



*Standardized ratios were computed and found to be less than 200, implying that the rates were not significantly higher than those for the State of Hawai'i. See Family Health Outcomes Project (FHOP), *Guidelines for Using Federal Data Templates with Small Numbers* (May 1, 1997). To avoid misinterpretation, these areas are low-lighted and should not be compared to colored bars. Refer to the discussion on the *Small Numbers Problem* in Chapter 1.

Table 10: Births with Less Than Adequate Prenatal Care Utilization, 2003-2008

Service Area	Number of Live Births	Number of Births with Less Than Adequate Prenatal Care Utilization	Percent of Births with Less Than Adequate Prenatal Care Utilization (%)	95% Confidence Interval
State of Hawai'i	111,964	32,747	29.2	(29.0 - 29.5)
Honolulu County	80,385	20,483	25.5	(25.2 - 25.8)
East Honolulu	14,311	3,606	25.2	(24.5 - 25.9)
West Honolulu	12,886	3,472	26.9	(26.2 - 27.7)
'Ewa	28,487	6,769	23.8	(23.3 - 24.3)
Wahiawā	4,939	1,363	27.6	(26.4 - 28.8)
Wai'anae	5,690	1,523	26.8	(25.6 - 27.9)
Waialua	1,672	426	25.5	(23.4 - 27.6)
Ko'olauloa	2,237	696	31.1	(29.2 - 33.0)
Ko'olaupoko	9,941	2,565	25.8	(24.9 - 26.7)
Hawai'i County	14,203	4,632	32.6	(31.8 - 33.4)
Hilo	4,018	1,031	25.7	(24.3 - 27.0)
Puna	3,166	896	28.3	(26.7 - 29.9)
Ka'ū	582	271	46.6	(42.5 - 50.6)
South Kona	930	463	49.8	(46.6 - 53.0)
North Kona	2,912	1,248	42.9	(41.1 - 44.7)
South Kohala	1,533	424	27.7	(25.4 - 29.9)
North Kohala	423	131	31.0	(26.6 - 35.4)
Hāmakuā	628	164	26.1	(22.7 - 29.6)
Maui County	12,015	6,038	50.3	(49.4 - 51.1)
Hāna	188	127	67.6	(60.9 - 74.2)
Makawao	2,808	1,386	49.4	(47.5 - 51.2)
Wailuku	6,375	3,307	51.9	(50.6 - 53.1)
Lāhainā	1,792	960	53.6	(51.3 - 55.9)
Lāna'i	248	85	34.3	(28.4 - 40.2)
Moloka'i	598	172	28.8	(25.1 - 32.4)
Kaua'i County	5,016	1,482	29.5	(28.3 - 30.8)
Hanalei	464	158	34.1	(29.7 - 38.4)
Kapa'a	1,608	526	32.7	(30.4 - 35.0)
Līhu'e	1,164	288	24.7	(22.3 - 27.2)
Kōloa	1,010	261	25.8	(23.1 - 28.5)
Waimea	765	246	32.2	(28.8 - 35.5)

Source: State of Hawai'i, Department of Health, Office of Health Status Monitoring

Chart 18: Percent of Births with Less Than Adequate Prenatal Care Utilization, 2003-2008

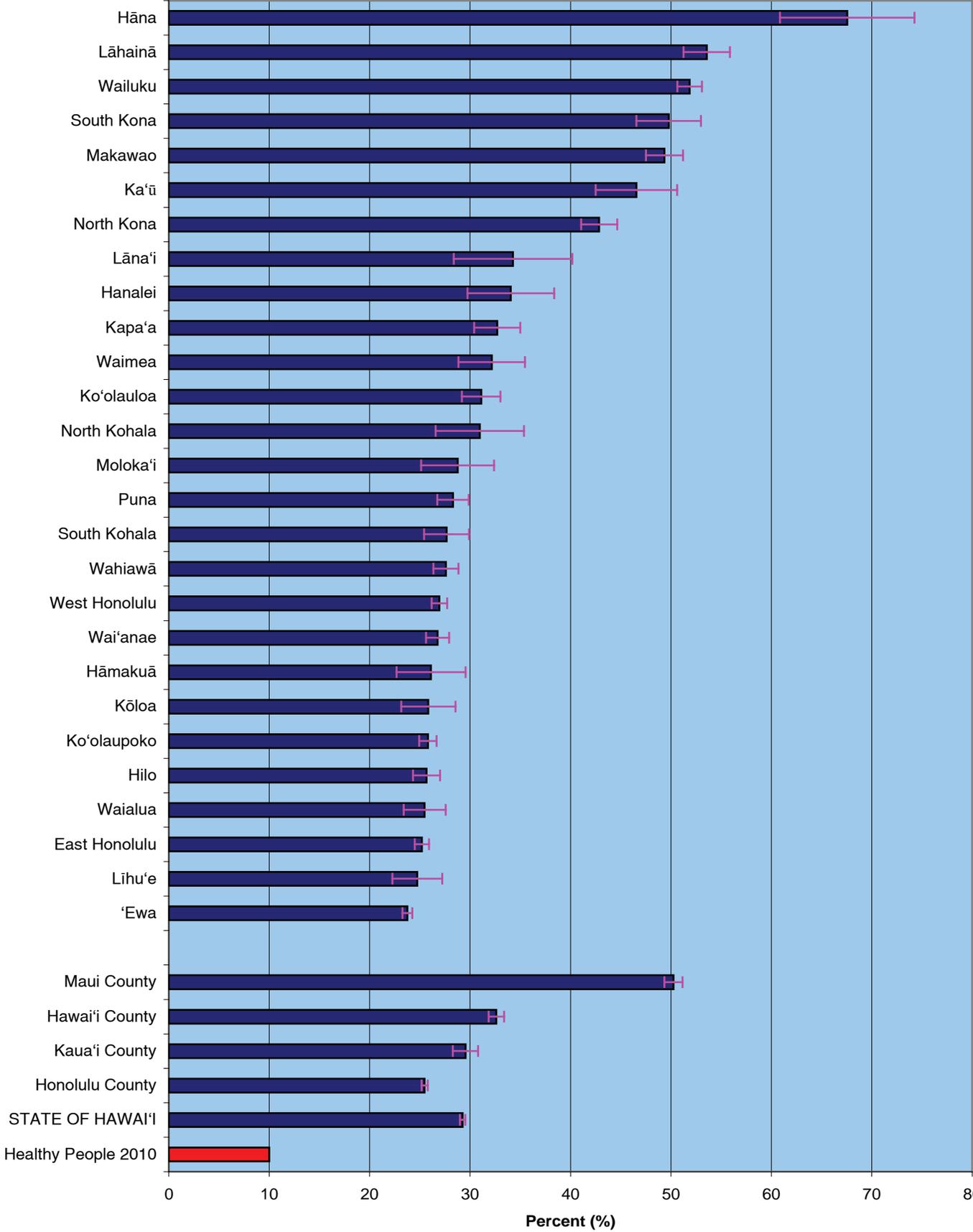


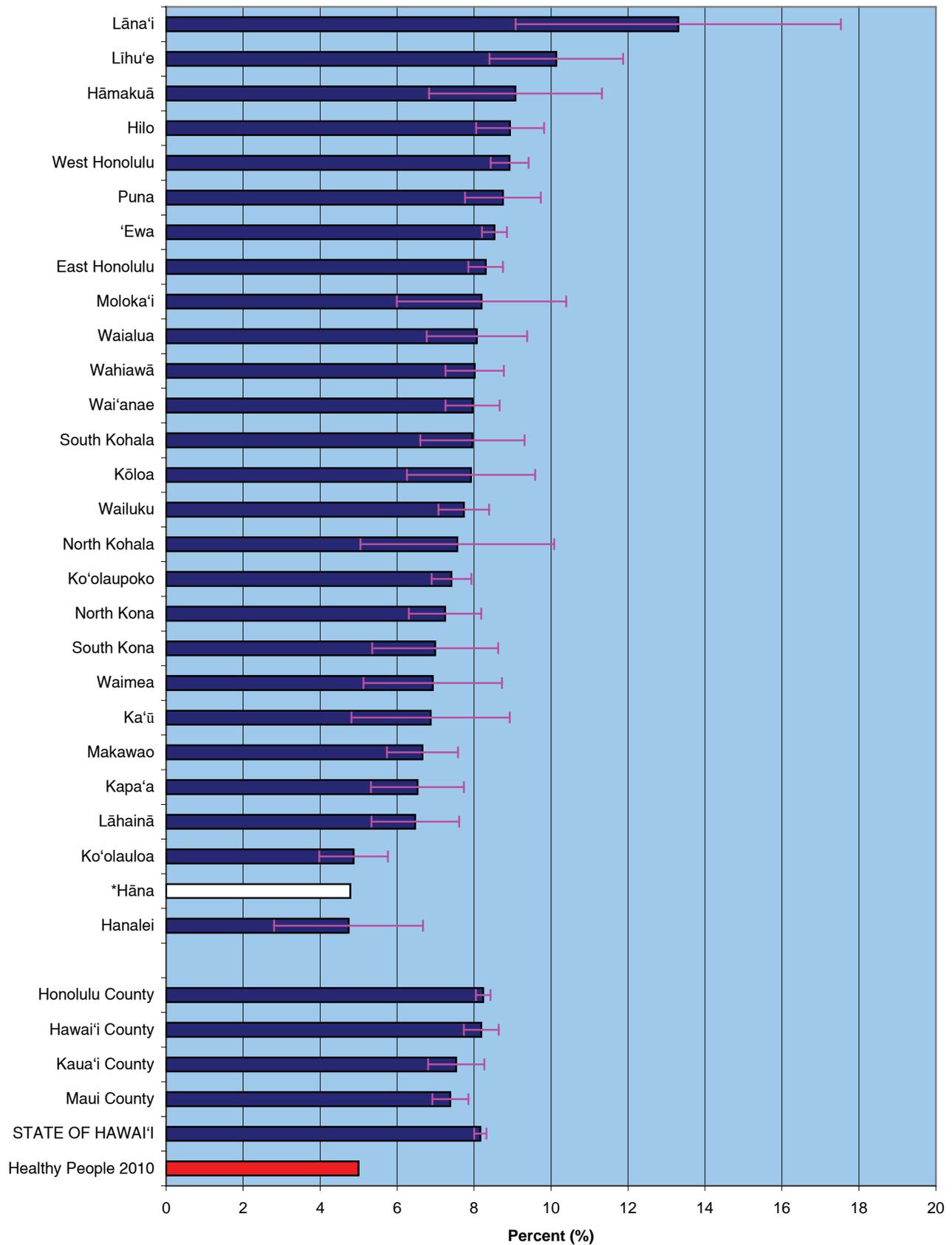
Table 11: Births with Low Birth Weight, 2003-2008

Service Area	Number of Live Births	Number of Births with Low Birth Weight	Percent of Births with Low Birth Weight (%)	95% Confidence Interval
State of Hawai'i	111,964	9,139	8.2	(8.0 - 8.3)
Honolulu County	80,385	6,622	8.2	(8.0 - 8.4)
East Honolulu	14,311	1,188	8.3	(7.8 - 8.8)
West Honolulu	12,886	1,150	8.9	(8.4 - 9.4)
'Ewa	28,487	2,430	8.5	(8.2 - 8.9)
Wahiawā	4,939	396	8.0	(7.3 - 8.8)
Wai'anae	5,690	453	8.0	(7.3 - 8.7)
Waialua	1,672	135	8.1	(6.8 - 9.4)
Ko'olauloa	2,237	109	4.9	(4.0 - 5.8)
Ko'olaupoko	9,941	737	7.4	(6.9 - 7.9)
Hawai'i County	14,203	1,163	8.2	(7.7 - 8.6)
Hilo	4,018	359	8.9	(8.1 - 9.8)
Puna	3,166	277	8.7	(7.8 - 9.7)
Ka'ū	582	40	6.9	(4.8 - 8.9)
South Kona	930	65	7.0	(5.4 - 8.6)
North Kona	2,912	211	7.2	(6.3 - 8.2)
South Kohala	1,533	122	8.0	(6.6 - 9.3)
North Kohala	423	32	7.6	(5.0 - 10.1)
Hāmakuā	628	57	9.1	(6.8 - 11.3)
Maui County	12,015	887	7.4	(6.9 - 7.9)
Hāna	188	9	4.8	---
Makawao	2,808	187	6.7	(5.7 - 7.6)
Wailuku	6,375	493	7.7	(7.1 - 8.4)
Lāhainā	1,792	116	6.5	(5.3 - 7.6)
Lāna'i	248	33	13.3	(9.1 - 17.5)
Moloka'i	598	49	8.2	(6.0 - 10.4)
Kaua'i County	5,016	378	7.5	(6.8 - 8.3)
Hanalei	464	22	4.7	(2.8 - 6.7)
Kapa'a	1,608	105	6.5	(5.3 - 7.7)
Līhu'e	1,164	118	10.1	(8.4 - 11.9)
Kōloa	1,010	80	7.9	(6.3 - 9.6)
Waimea	765	53	6.9	(5.1 - 8.7)

Source: State of Hawai'i, Department of Health, Office of Health Status Monitoring

No confidence intervals were computed when the numerators were less than 20. Instead, standardized ratios were computed and found to be less than 200, implying that the rates were not significantly higher than those for the State of Hawai'i. See Family Health Outcomes Project (FHOP), *Guidelines for Using Federal Data Templates with Small Numbers* (May 1, 1997).

Chart 19: Percent of Births with Low Birth Weight, 2003-2008



*Standardized ratios were computed and found to be less than 200, implying that the rates were not significantly higher than those for the State of Hawaiʻi. See Family Health Outcomes Project (FHOP), *Guidelines for Using Federal Data Templates with Small Numbers* (May 1, 1997). To avoid misinterpretation, these areas are low-lighted and should not be compared to colored bars. Refer to the discussion on the *Small Numbers Problem* in Chapter 1.

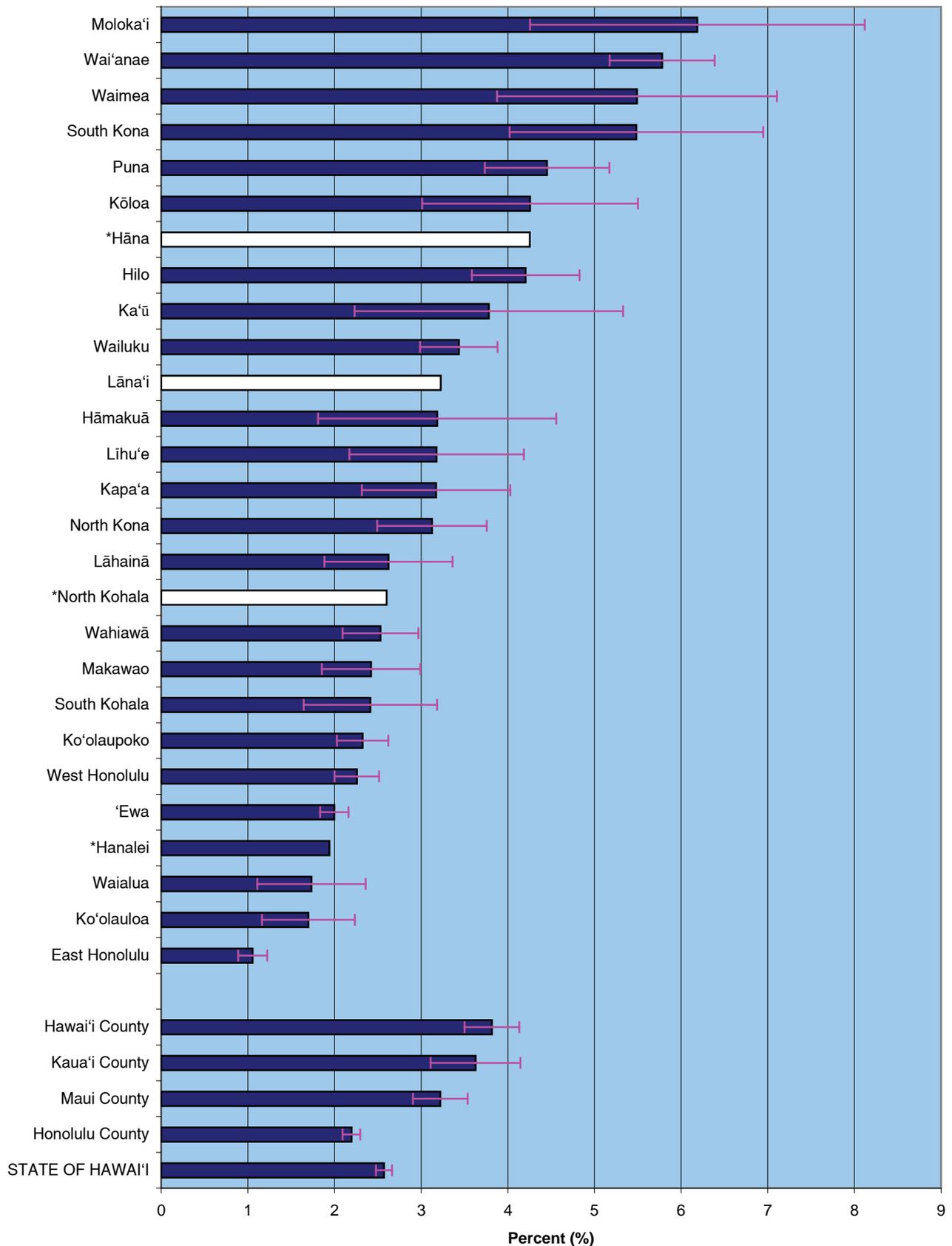
Table 12: Births to Teens 10 to 17 Years of Age, 2003-2008

Service Area	Number of Live Births	Number of Births to Teens 10 to 17 Years of Age	Percent of Births to Teens 10 to 17 Years of Age (%)	95% Confidence Interval
State of Hawai'i	111,964	2,878	2.6	(2.5 - 2.7)
Honolulu County	80,385	1,765	2.2	(2.1 - 2.3)
East Honolulu	14,311	151	1.1	(0.9 - 1.2)
West Honolulu	12,886	291	2.3	(2.0 - 2.5)
'Ewa	28,487	569	2.0	(1.8 - 2.2)
Wahiawā	4,939	125	2.5	(2.1 - 3.0)
Wai'anae	5,690	329	5.8	(5.2 - 6.4)
Waialua	1,672	29	1.7	(1.1 - 2.4)
Ko'olauloa	2,237	38	1.7	(1.2 - 2.2)
Ko'olaupoko	9,941	231	2.3	(2.0 - 2.6)
Hawai'i County	14,203	542	3.8	(3.5 - 4.1)
Hilo	4,018	169	4.2	(3.6 - 4.8)
Puna	3,166	141	4.5	(3.7 - 5.2)
Ka'ū	582	22	3.8	(2.2 - 5.3)
South Kona	930	51	5.5	(4.0 - 6.9)
North Kona	2,912	91	3.1	(2.5 - 3.8)
South Kohala	1,533	37	2.4	(1.6 - 3.2)
North Kohala	423	11	2.6	---
Hāmakuā	628	20	3.2	(1.8 - 4.6)
Maui County	12,015	387	3.2	(2.9 - 3.5)
Hāna	188	8	4.3	---
Makawao	2,808	68	2.4	(1.9 - 3.0)
Wailuku	6,375	219	3.4	(3.0 - 3.9)
Lāhainā	1,792	47	2.6	(1.9 - 3.4)
Lāna'i	248	8	3.2	---
Moloka'i	598	37	6.2	(4.3 - 8.1)
Kaua'i County	5,016	182	3.6	(3.1 - 4.1)
Hanalei	464	9	1.9	---
Kapa'a	1,608	51	3.2	(2.3 - 4.0)
Līhu'e	1,164	37	3.2	(2.2 - 4.2)
Kōloa	1,010	43	4.3	(3.0 - 5.5)
Waimea	765	42	5.5	(3.9 - 7.1)

Source: State of Hawai'i, Department of Health, Office of Health Status Monitoring

No confidence intervals were computed when the numerators were less than 20. Instead, standardized ratios were computed and found to be less than 200, implying that the rates were not significantly higher than those for the State of Hawai'i. See Family Health Outcomes Project (FHOP), *Guidelines for Using Federal Data Templates with Small Numbers* (May 1, 1997).

Chart 20: Percent of Births to Teens 10 to 17 Years of Age, 2003-2008



*Standardized ratios were computed and found to be less than 200, implying that the rates were not significantly higher than those for the State of Hawai'i. See Family Health Outcomes Project (FHOP), *Guidelines for Using Federal Data Templates with Small Numbers* (May 1, 1997). To avoid misinterpretation, these areas are low-lighted and should not be compared to colored bars. Refer to the discussion on the *Small Numbers Problem* in Chapter 1.

Table 13: Births to Mothers with Pre-Existing Medical Conditions, 2003-2008

Service Area	Number of Live Births	Number of Births to Mothers with Pre-Existing Medical Conditions	Percent of Births to Mothers with Pre-Existing Medical Conditions (%)	95% Confidence Interval
State of Hawai'i	111,964	49,774	44.5	(44.2 - 44.7)
Honolulu County	80,385	38,498	47.9	(47.5 - 48.2)
East Honolulu	14,311	7,210	50.4	(49.6 - 51.2)
West Honolulu	12,886	6,043	46.9	(46.0 - 47.8)
'Ewa	28,487	13,839	48.6	(48.0 - 49.2)
Wahiawā	4,939	1,794	36.3	(35.0 - 37.7)
Wai'anae	5,690	3,295	57.9	(56.6 - 59.2)
Waialua	1,672	596	35.6	(33.4 - 37.9)
Ko'olauloa	2,237	1,196	53.5	(51.4 - 55.5)
Ko'olaupoko	9,941	4,423	44.5	(43.5 - 45.5)
Hawai'i County	14,203	5,725	40.3	(39.5 - 41.1)
Hilo	4,018	2,540	63.2	(61.7 - 64.7)
Puna	3,166	1,870	59.1	(57.4 - 60.8)
Ka'ū	582	198	34.0	(30.2 - 37.9)
South Kona	930	86	9.2	(7.4 - 11.1)
North Kona	2,912	367	12.6	(11.4 - 13.8)
South Kohala	1,533	359	23.4	(21.3 - 25.5)
North Kohala	423	111	26.2	(22.0 - 30.4)
Hāmakuā	628	191	30.4	(26.8 - 34.0)
Maui County	12,015	3,598	29.9	(29.1 - 30.8)
Hāna	188	57	30.3	(23.7 - 36.9)
Makawao	2,808	777	27.7	(26.0 - 29.3)
Wailuku	6,375	1,857	29.1	(28.0 - 30.2)
Lāhainā	1,792	505	28.2	(26.1 - 30.3)
Lāna'i	248	126	50.8	(44.6 - 57.0)
Moloka'i	598	274	45.8	(41.8 - 49.8)
Kaua'i County	5,016	1,805	36.0	(34.7 - 37.3)
Hanalei	464	132	28.4	(24.3 - 32.6)
Kapa'a	1,608	540	33.6	(31.3 - 35.9)
Līhu'e	1,164	459	39.4	(36.6 - 42.2)
Kōloa	1,010	368	36.4	(33.5 - 39.4)
Waimea	765	304	39.7	(36.3 - 43.2)

Source: State of Hawai'i, Department of Health, Office of Health Status Monitoring

Chart 21: Percent of Births to Mothers with Pre-Existing Medical Conditions, 2003-2008

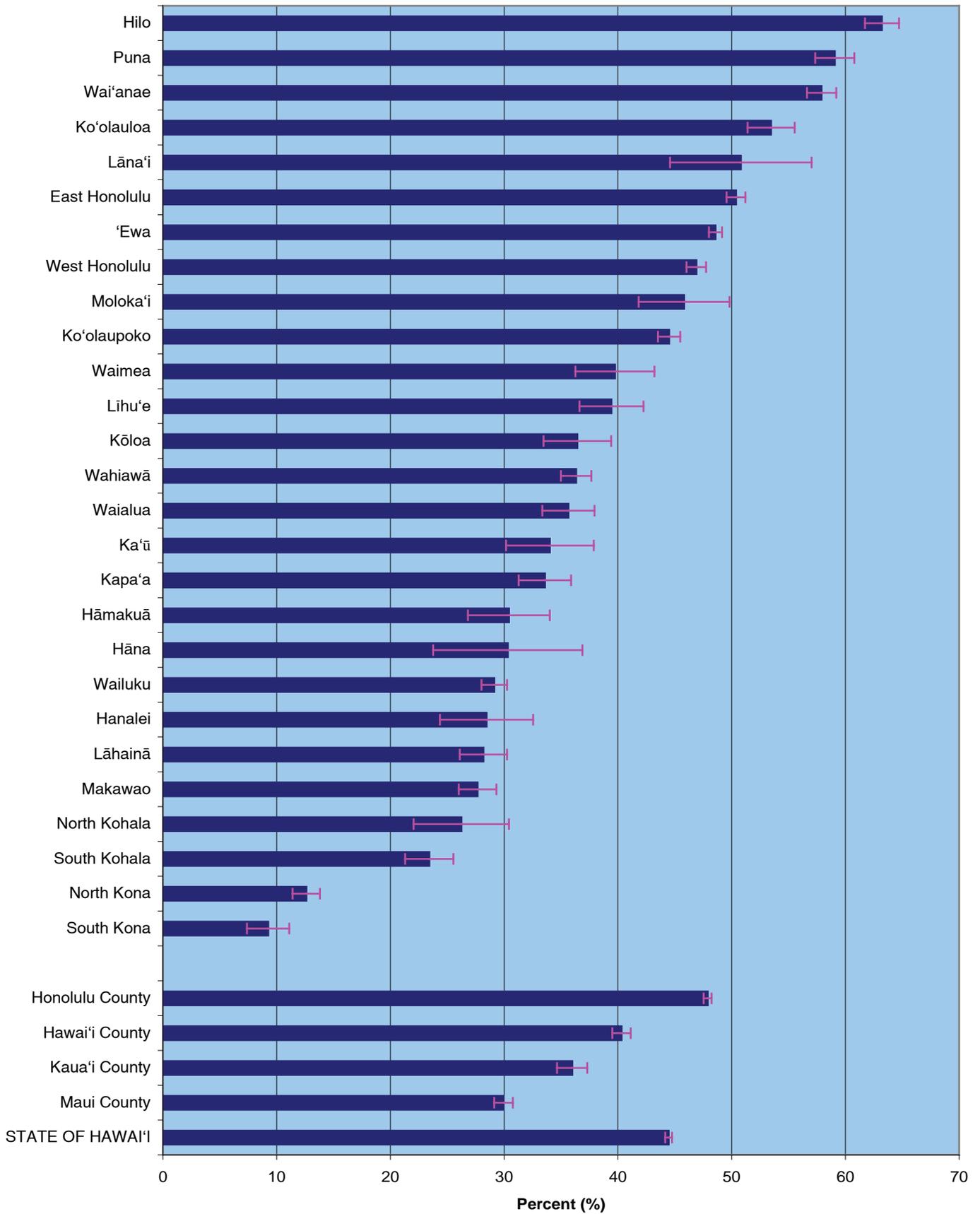
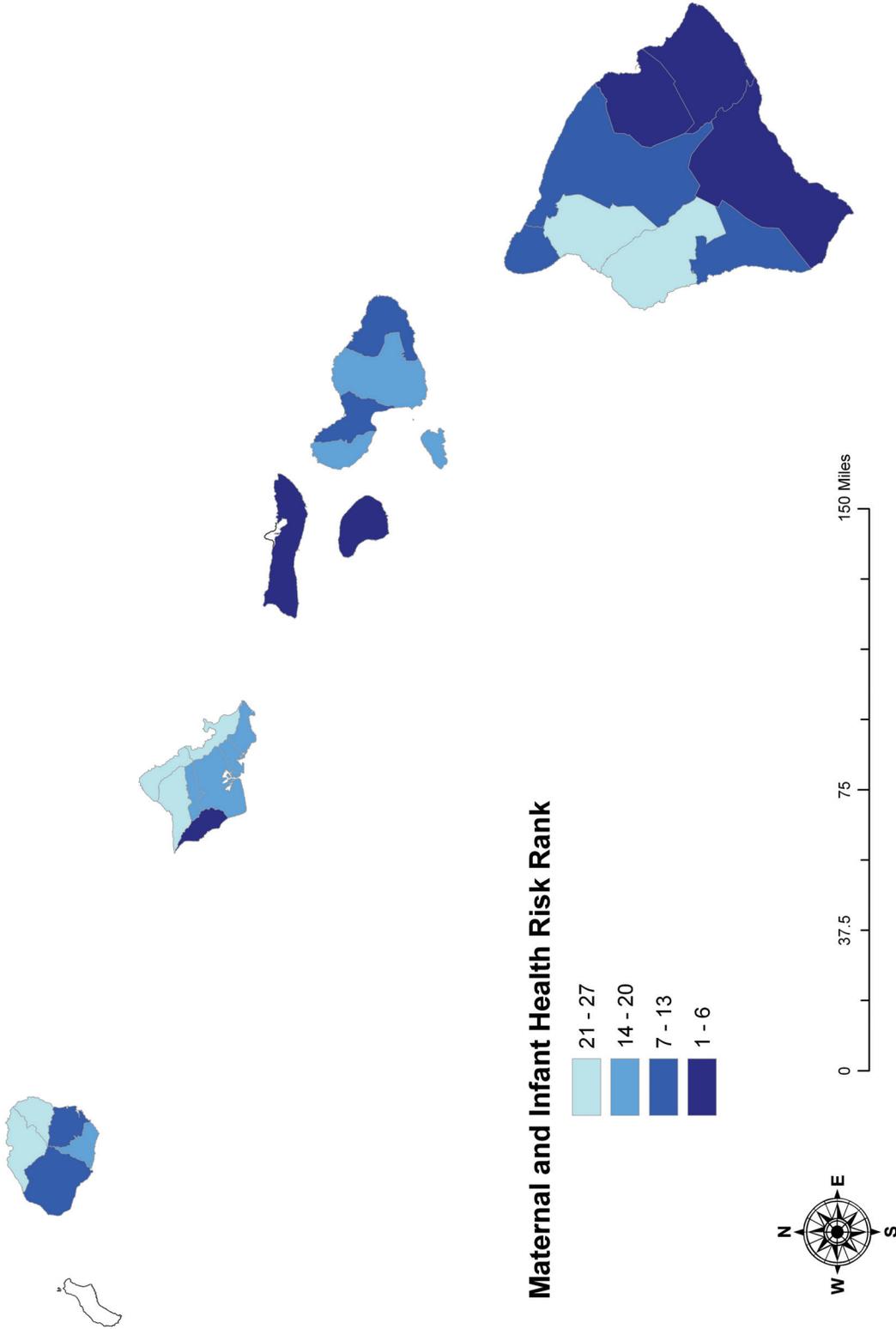


Table 14: Summary of Indicators for Maternal and Infant Health Risk Index, 2003-2008

	Infant Mortality Rate (IMR)	Percent of Births with Less Than Adequate Prenatal Care Utilization (%)	Percent of Births with Low Birth Weight (%)	Percent of Births to Teens 10 to 17 Years of Age (%)	Percent of Births to Mothers with Pre-Existing Medical Conditions (%)
State of Hawai'i	6.3	29.2	8.2	2.6	44.5
Honolulu County	6.2	25.5	8.2	2.2	47.9
East Honolulu	6.1	25.2	8.3	1.1	50.4
West Honolulu	6.2	26.9	8.9	2.3	46.9
'Ewa	6.1	23.8	8.5	2.0	48.6
Wahiawā	6.5	27.6	8.0	2.5	36.3
Wai'anae	9.3	26.8	8.0	5.8	57.9
Waialua	6.0	25.5	8.1	1.7	35.6
Ko'olauloa	6.3	31.1	4.9	1.7	53.5
Ko'olaupoko	4.6	25.8	7.4	2.3	44.5
Hawai'i County	6.5	32.6	8.2	3.8	40.3
Hilo	5.7	25.7	8.9	4.2	63.2
Puna	5.7	28.3	8.7	4.5	59.1
Ka'ū	17.2	46.6	6.9	3.8	34.0
South Kona	6.5	49.8	7.0	5.5	9.2
North Kona	5.2	42.9	7.2	3.1	12.6
South Kohala	5.2	27.7	8.0	2.4	23.4
North Kohala	14.2	31.0	7.6	2.6	26.2
Hāmakuā	11.1	26.1	9.1	3.2	30.4
Maui County	3.9	50.3	7.4	3.2	29.9
Hāna	5.3	67.6	4.8	4.3	30.3
Makawao	3.6	49.4	6.7	2.4	27.7
Wailuku	3.8	51.9	7.7	3.4	29.1
Lāhainā	4.5	53.6	6.5	2.6	28.2
Lāna'i	4.0	34.3	13.3	3.2	50.8
Moloka'i	5.0	28.8	8.2	6.2	45.8
Kaua'i County	6.0	29.5	7.5	3.6	36.0
Hanalei	4.3	34.1	4.7	1.9	28.4
Kapa'a	5.0	32.7	6.5	3.2	33.6
Līhu'e	6.9	24.7	10.1	3.2	39.4
Kōloa	5.9	25.8	7.9	4.3	36.4
Waimea	7.8	32.2	6.9	5.5	39.7

Table 15: Ranking Based on Maternal and Infant Health Risk Index

Ranking of Service Areas by County			State-Wide Ranking of Service Areas		
Service Area	Risk Rank	Risk Score	Service Area	Risk Rank	Risk Score
Honolulu County (highest)			State of Hawai'i (highest)		
Wai'anae	1	3.7	Ka'ū	1	4.1
West Honolulu	2	-0.2	Wai'anae	2	3.7
'Ewa	3	-0.8	Lāna'i	3	3.3
Wahiawā	4	-1.1	Hilo	4	2.2
East Honolulu	5	-1.4	Puna	5	2.2
Ko'olaupoko	6	-1.8	Moloka'i	6	2.0
Ko'olauloa	7	-2.1	Waimea	7	1.5
Waialua	8	-2.1	Hāna	8	0.9
(lowest)			Hāmakuā	9	0.9
Hawai'i County (highest)			Līhu'e	10	0.7
Ka'ū	1	4.1	North Kohala	11	0.7
Hilo	2	2.2	South Kona	12	0.4
Puna	3	2.2	Wailuku	13	0.1
Hāmakuā	4	0.9	West Honolulu	14	-0.2
North Kohala	5	0.7	Kōloa	15	-0.2
South Kona	6	0.4	'Ewa	16	-0.8
North Kona	7	-2.0	Lāhainā	17	-1.0
South Kohala	8	-2.6	Wahiawā	18	-1.1
(lowest)			East Honolulu	19	-1.4
Maui County (highest)			Makawao	20	-1.7
Lāna'i	1	3.3	Kapa'a	21	-1.8
Moloka'i	2	2.0	Ko'olaupoko	22	-1.8
Hāna	3	0.9	North Kona	23	-2.0
Wailuku	4	0.1	Ko'olauloa	24	-2.1
Lāhainā	5	-1.0	Waialua	25	-2.1
Makawao	6	-1.7	South Kohala	26	-2.6
(lowest)			Hanalei	27	-4.2
Kaua'i County (highest)			(lowest)		
Waimea	1	1.5			
Līhu'e	2	0.7			
Kōloa	3	-0.2			
Kapa'a	4	-1.8			
Hanalei	5	-4.2			
(lowest)					



Map 9: Maternal and Infant Health Risk Index by Primary Care Service Area

CHAPTER 5: MORBIDITY

This section of the data book builds on the success of the developmental indicators and indices used in the 2005 and 2007 editions. To broaden the scope of this data book, we have included additional indicators contributing to the leading causes of death in Hawai'i and across the nation. We separated the risk factors (morbidity) and the eventual outcome (mortality) in two separate chapters and indices. The morbidity index can be found in Table 22, Table 23, and in Map 10.

MORBIDITY INDICATORS

The morbidity indicators based on adult risk factors, using aggregated data from 2003-2008 unless noted, were defined as follows:

Adults who are Obese	=	Self-reported height and weight measurements consistent with a calculated Body Mass Index (BMI) of 30.0 or greater.
Adults who Smoke	=	Self-reported intake of current smoking and at least 100 cigarettes in a lifetime
Adults who are Heavy Drinkers	=	Self-reported intake of greater than one drink per day on average in the past 30 days
Adults with No Physical Activity	=	Self-report of not participating in any physical activity or exercises during the past month outside of those occurring in activities at work
Adults with Diabetes	=	Ever told had diabetes by a health care provider
Adults with High Blood Pressure	=	Ever told had high blood pressure by a health care provider

BRFSS Data

The Behavioral Risk Factor Surveillance System (BRFSS) data includes characteristics about adults, 18 years of age and over. Information on health risk behaviors, preventive health practices, and health care access primarily related to chronic disease and injury are collected.

Healthy People 2010

The Healthy People 2010 objectives for obesity, smoking, diabetes, and high blood pressure were included in our bar graph analysis and are shown in Charts 22, 23, 26, and 27.

Table 16: Adults who are Obese, 2003-2008

Service Area	Estimated Annual Adult Population	Estimated Annual Number of Adults who are Obese	Percent of Adults who are Obese (%)	95% Confidence Interval
State of Hawai'i	948,282	194,328	20.5	(19.8 - 21.2)
Honolulu County	661,561	135,031	20.4	(19.5 - 21.3)
East Honolulu	176,135	27,251	15.5	(14.1 - 17.0)
West Honolulu	88,828	15,322	17.3	(14.9 - 19.9)
'Ewa	221,184	46,015	20.8	(19.2 - 22.5)
Wahiawā	2,264	675	29.8	(18.7 - 43.9)
Wai'anae	35,654	14,113	39.6	(34.4 - 45.0)
Waialua	30,065	6,731	22.4	(18.2 - 27.2)
Ko'olauloa	10,329	3,273	31.7	(24.5 - 39.9)
Ko'olaupoko	97,102	21,651	22.3	(20.1 - 24.7)
Hawai'i County	118,259	25,637	21.7	(20.4 - 23.0)
Hilo	37,870	8,482	22.4	(20.1 - 24.9)
Puna	18,147	3,836	21.1	(18.1 - 24.6)
Ka'ū	13,647	3,592	26.3	(21.8 - 31.4)
South Kona	13,598	2,638	19.4	(16.4 - 22.8)
North Kona	20,470	3,848	18.8	(16.1 - 21.8)
South Kohala	3,796	653	17.2	(12.3 - 23.6)
North Kohala	4,033	866	21.5	(14.7 - 30.3)
Hāmakuā	6,698	1,724	25.7	(19.8 - 32.8)
Maui County	98,939	20,496	20.7	(19.2 - 22.4)
Hāna	1,705	343	20.1	(11.6 - 32.6)
Makawao	26,121	4,567	17.5	(15.0 - 20.3)
Wailuku	45,837	9,366	20.4	(18.0 - 23.1)
Lāhainā	13,030	3,074	23.6	(19.1 - 28.8)
Lāna'i	2,079	343	16.5	(13.7 - 19.8)
Moloka'i	10,166	2,803	27.6	(23.8 - 31.6)
Kaua'i County	44,492	9,182	20.6	(18.7 - 22.7)
Hanalei	4,951	748	15.1	(10.5 - 21.2)
Kapa'a	13,204	2,836	21.5	(18.4 - 25.0)
Līhu'e	9,345	1,865	20.0	(16.2 - 24.3)
Kōloa	9,886	1,827	18.5	(15.0 - 22.6)
Waimea	7,107	1,906	26.8	(20.6 - 34.2)

Source: State of Hawai'i, Department of Health, Behavioral Risk Factor Surveillance System (BRFSS)

Chart 22: Percent of Adults who are Obese, 2003-2008

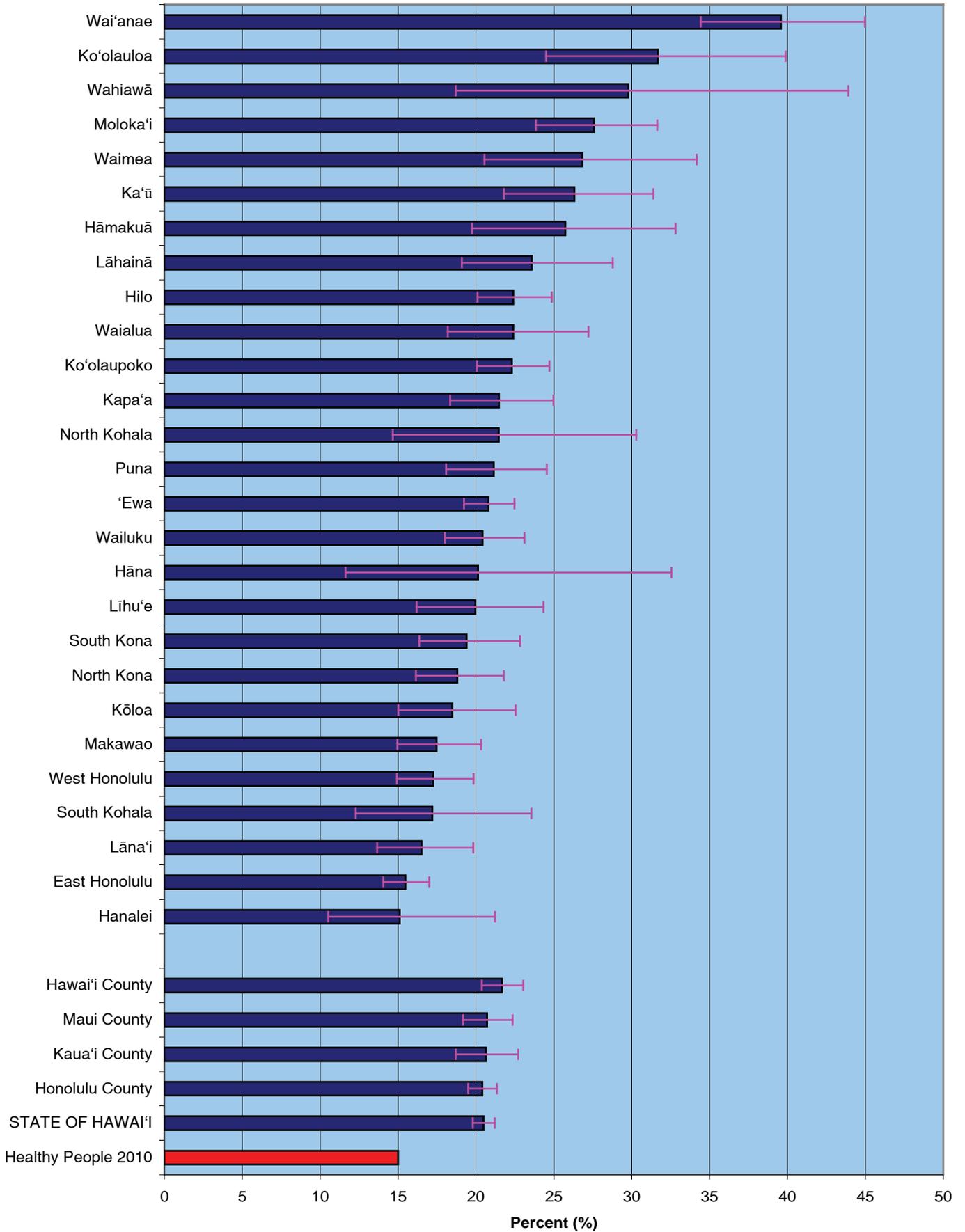


Table 17: Adults who Smoke, 2003-2008

Service Area	Estimated Annual Adult Population	Estimated Annual Number Adults who Smoke	Percent of Adults who Smoke (%)	95% Confidence Interval
State of Hawai'i	975,194	164,783	16.9	(16.3 - 17.5)
Honolulu County	675,466	109,739	16.3	(15.5 - 17.1)
East Honolulu	179,473	26,511	14.8	(13.4 - 16.3)
West Honolulu	90,953	15,712	17.3	(15.0 - 19.8)
'Ewa	226,368	35,588	15.7	(14.4 - 17.2)
Wahiawā	2,305	543	23.5	(14.5 - 35.8)
Wai'anae	36,443	9,841	27.0	(22.6 - 31.9)
Waialua	30,583	6,030	19.7	(16.0 - 24.0)
Ko'olauloa	10,479	2,360	22.5	(15.6 - 31.4)
Ko'olaupoko	98,863	13,156	13.3	(11.6 - 15.2)
Hawai'i County	121,668	23,207	19.1	(17.8 - 20.4)
Hilo	38,806	7,777	20.0	(17.8 - 22.5)
Puna	18,568	4,139	22.3	(19.1 - 25.8)
Ka'ū	14,828	3,239	21.8	(18.1 - 26.2)
South Kona	13,941	2,213	15.9	(12.9 - 19.3)
North Kona	20,745	3,081	14.9	(12.4 - 17.7)
South Kohala	3,853	652	16.9	(11.9 - 23.5)
North Kohala	4,123	924	22.4	(15.3 - 31.6)
Hāmakuā	6,804	1,182	17.4	(13.0 - 22.9)
Maui County	101,836	18,582	18.3	(16.8 - 19.9)
Hāna	1,808	389	21.5	(12.8 - 33.9)
Makawao	26,836	4,687	17.5	(14.6 - 20.7)
Wailuku	47,090	8,640	18.4	(16.0 - 20.9)
Lāhainā	13,505	2,664	19.7	(15.7 - 24.6)
Lāna'i	2,093	371	17.7	(14.2 - 22.0)
Moloka'i	10,504	1,830	17.4	(14.4 - 20.9)
Kaua'i County	45,827	8,197	17.9	(16.2 - 19.7)
Hanalei	5,196	660	12.7	(9.2 - 17.3)
Kapa'a	13,424	2,478	18.5	(15.5 - 21.9)
Līhu'e	9,695	1,693	17.5	(13.9 - 21.8)
Kōloa	10,228	1,673	16.4	(13.1 - 20.3)
Waimea	7,284	1,693	23.3	(18.3 - 29.1)

Source: State of Hawai'i, Department of Health, Behavioral Risk Factor Surveillance System (BRFSS)

Chart 23: Percent of Adults who Smoke, 2003-2008

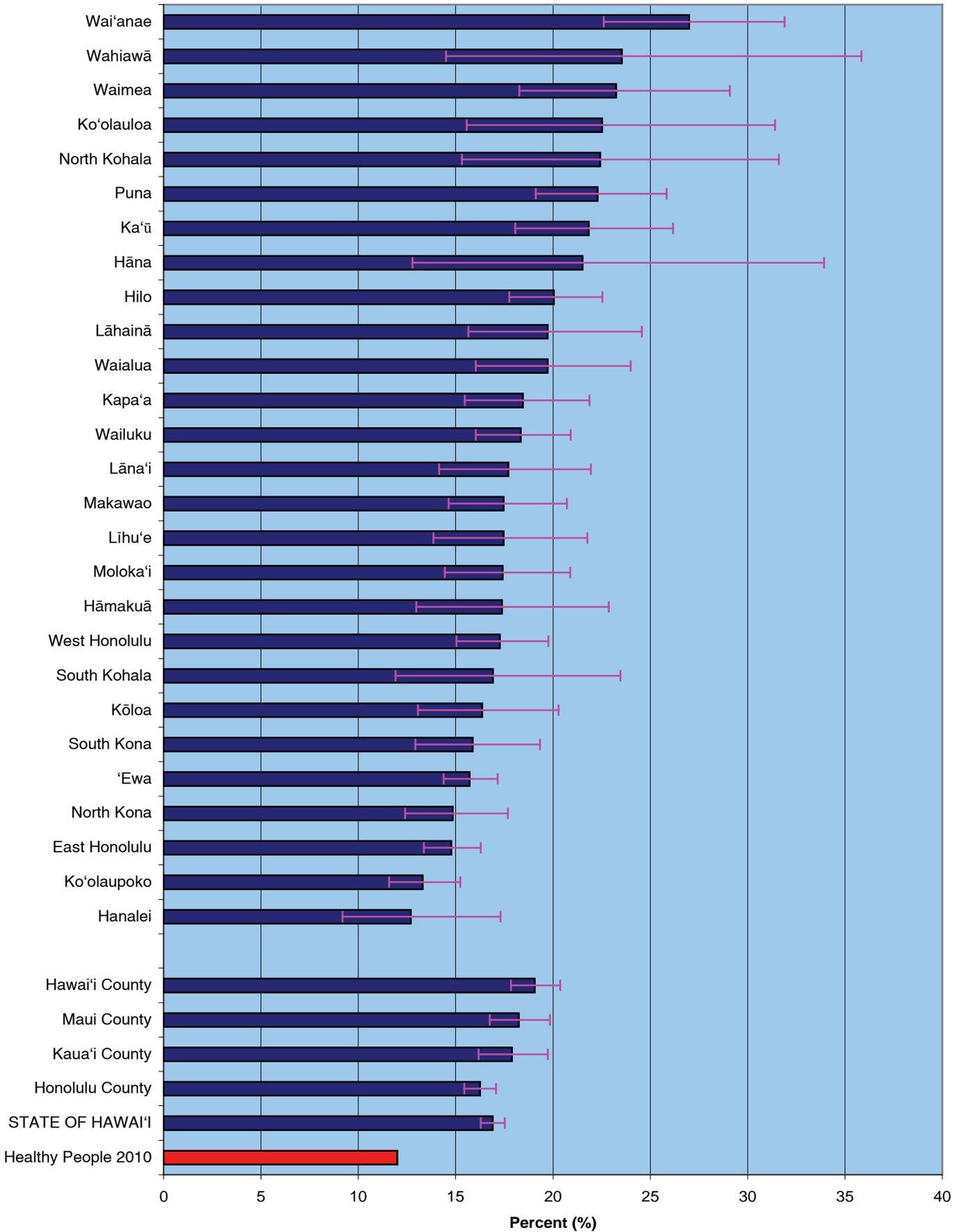


Table 18: Adults who are Heavy Drinkers, 2003-2008

Service Area	Estimated Annual Adult Population	Estimated Annual Number of Adults who are Heavy Drinkers	Percent of Adults who are Heavy Drinkers (%)	95% Confidence Interval
State of Hawai'i	964,063	69,650	7.2	(6.8 - 7.7)
Honolulu County	668,209	44,918	6.7	(6.2 - 7.3)
East Honolulu	177,745	12,210	6.9	(5.9 - 8.0)
West Honolulu	90,388	5,114	5.7	(4.3 - 7.4)
'Ewa	223,644	13,239	5.9	(4.9 - 7.1)
Wahiawā	2,277	242	10.6	(4.5 - 23.2)
Wai'anae	35,610	3,847	10.8	(7.9 - 14.7)
Waialua	30,122	2,072	6.9	(4.8 - 9.8)
Ko'olauloa	10,460	640	6.1	(3.2 - 11.3)
Ko'olaupoko	97,963	7,553	7.7	(6.4 - 9.3)
Hawai'i County	120,569	10,019	8.3	(7.4 - 9.3)
Hilo	38,582	3,475	9.0	(7.4 - 11.0)
Puna	18,250	882	4.8	(3.6 - 6.5)
Ka'ū	14,606	1,276	8.7	(5.8 - 13.0)
South Kona	13,892	1,129	8.1	(6.2 - 10.6)
North Kona	20,560	1,972	9.6	(7.7 - 11.8)
South Kohala	3,816	372	9.7	(5.7 - 16.1)
North Kohala	4,109	508	12.4	(6.4 - 22.5)
Hāmakuā	6,754	406	6.0	(3.4 - 10.4)
Maui County	100,833	8,837	8.8	(7.7 - 9.9)
Hāna	1,790	228	12.7	(6.0 - 25.1)
Makawao	26,765	2,297	8.6	(6.3 - 11.6)
Wailuku	46,516	3,337	7.2	(6.0 - 8.5)
Lāhainā	13,526	1,612	11.9	(8.6 - 16.3)
Lāna'i	2,079	179	8.6	(6.3 - 11.7)
Moloka'i	10,158	1,184	11.7	(8.6 - 15.6)
Kaua'i County	45,268	3,588	7.9	(6.7 - 9.3)
Hanalei	5,142	474	9.2	(6.6 - 12.8)
Kapa'a	13,277	1,098	8.3	(6.1 - 11.2)
Līhu'e	9,599	545	5.7	(3.8 - 8.5)
Kōloa	10,065	864	8.6	(6.3 - 11.6)
Waimea	7,186	607	8.4	(5.3 - 13.2)

Source: State of Hawai'i, Department of Health, Behavioral Risk Factor Surveillance System (BRFSS)

Chart 24: Percent of Adults who are Heavy Drinkers, 2003-2008

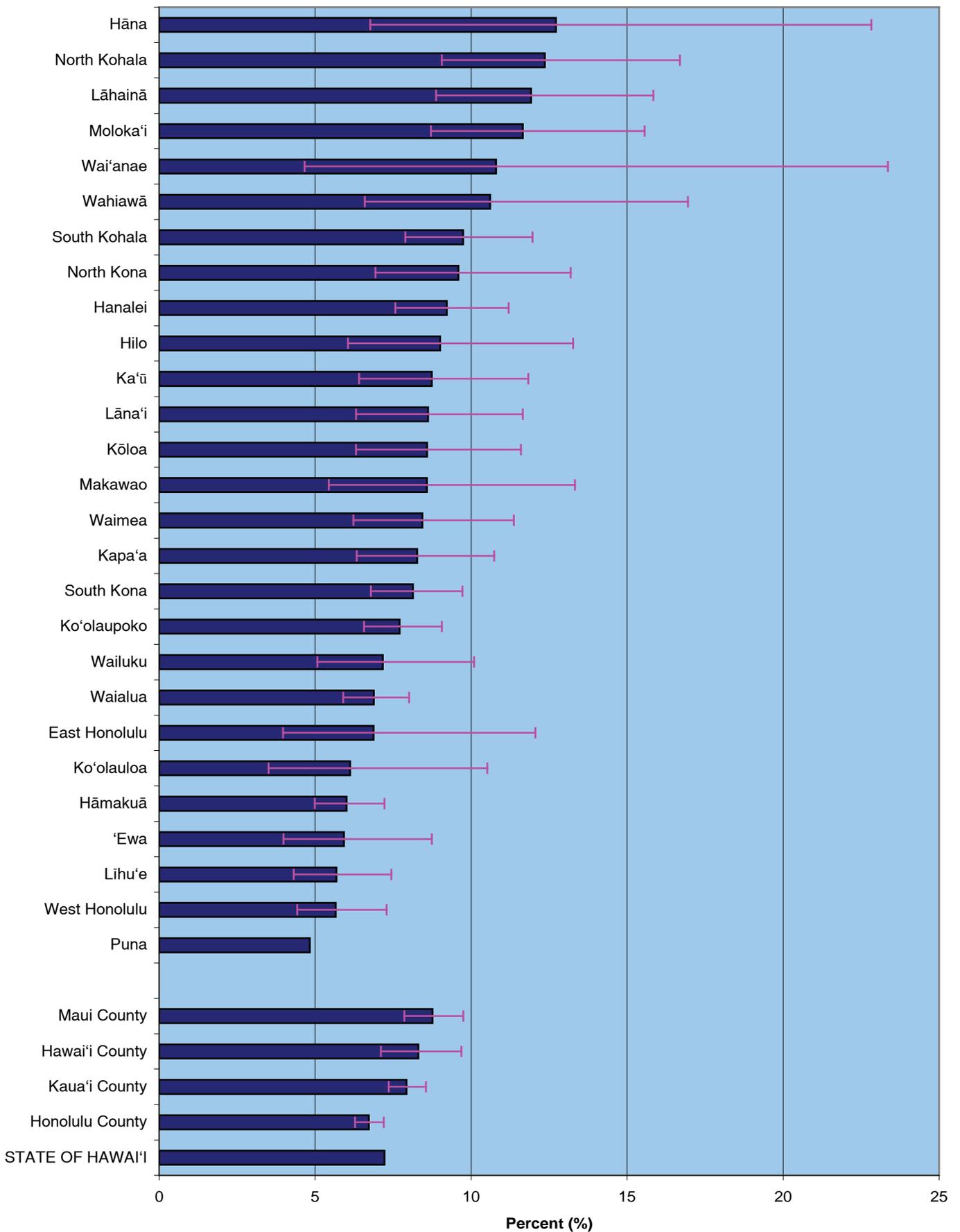


Table 19: Adults with No Physical Activity, 2003-2008

Service Area	Estimated Annual Adult Population	Estimated Annual Number of Adults With No Physical Activity	Percent of Adults With No Physical Activity (%)	95% Confidence Interval
State of Hawai'i	977,553	187,863	19.2	(18.6 - 19.9)
Honolulu County	676,772	130,771	19.3	(18.5 - 20.2)
East Honolulu	179,948	30,468	16.9	(15.6 - 18.4)
West Honolulu	91,373	21,529	23.6	(21.0 - 26.3)
'Ewa	226,344	43,534	19.2	(17.8 - 20.7)
Wahiawā	2,305	415	18.0	(10.7 - 28.6)
Wai'anae	36,764	8,925	24.3	(20.2 - 28.9)
Waialua	30,633	6,814	22.2	(18.3 - 26.8)
Ko'olauloa	10,479	2,518	24.0	(16.6 - 33.4)
Ko'olaupoko	98,926	16,569	16.8	(14.8 - 18.9)
Hawai'i County	121,985	23,282	19.1	(17.9 - 20.4)
Hilo	38,928	7,502	19.3	(17.3 - 21.4)
Puna	18,613	4,222	22.7	(19.7 - 26.0)
Ka'ū	14,828	3,405	23.0	(18.5 - 28.1)
South Kona	14,004	2,236	16.0	(13.1 - 19.3)
North Kona	20,813	3,184	15.3	(13.0 - 17.9)
South Kohala	3,858	688	17.8	(12.4 - 24.9)
North Kohala	4,123	599	14.5	(9.6 - 21.4)
Hāmakuā	6,818	1,446	21.2	(15.6 - 28.2)
Maui County	102,237	18,832	18.4	(17.0 - 19.9)
Hāna	1,808	278	15.4	(7.8 - 27.9)
Makawao	26,963	4,172	15.5	(13.2 - 18.1)
Wailuku	47,286	9,182	19.4	(17.2 - 21.8)
Lāhainā	13,562	2,694	19.9	(15.4 - 25.2)
Lāna'i	2,099	426	20.3	(16.2 - 25.2)
Moloka'i	10,517	2,081	19.8	(16.4 - 23.6)
Kaua'i County	46,039	8,091	17.6	(16.0 - 19.3)
Hanalei	5,201	406	7.8	(5.4 - 11.2)
Kapa'a	13,517	2,247	16.6	(13.9 - 19.8)
Līhu'e	9,768	1,969	20.2	(16.5 - 24.3)
Kōloa	10,254	1,925	18.8	(15.4 - 22.6)
Waimea	7,299	1,545	21.2	(16.5 - 26.7)

Source: State of Hawai'i, Department of Health, Behavioral Risk Factor Surveillance System (BRFSS)

Chart 25: Percent of Adults with No Physical Activity, 2003-2008

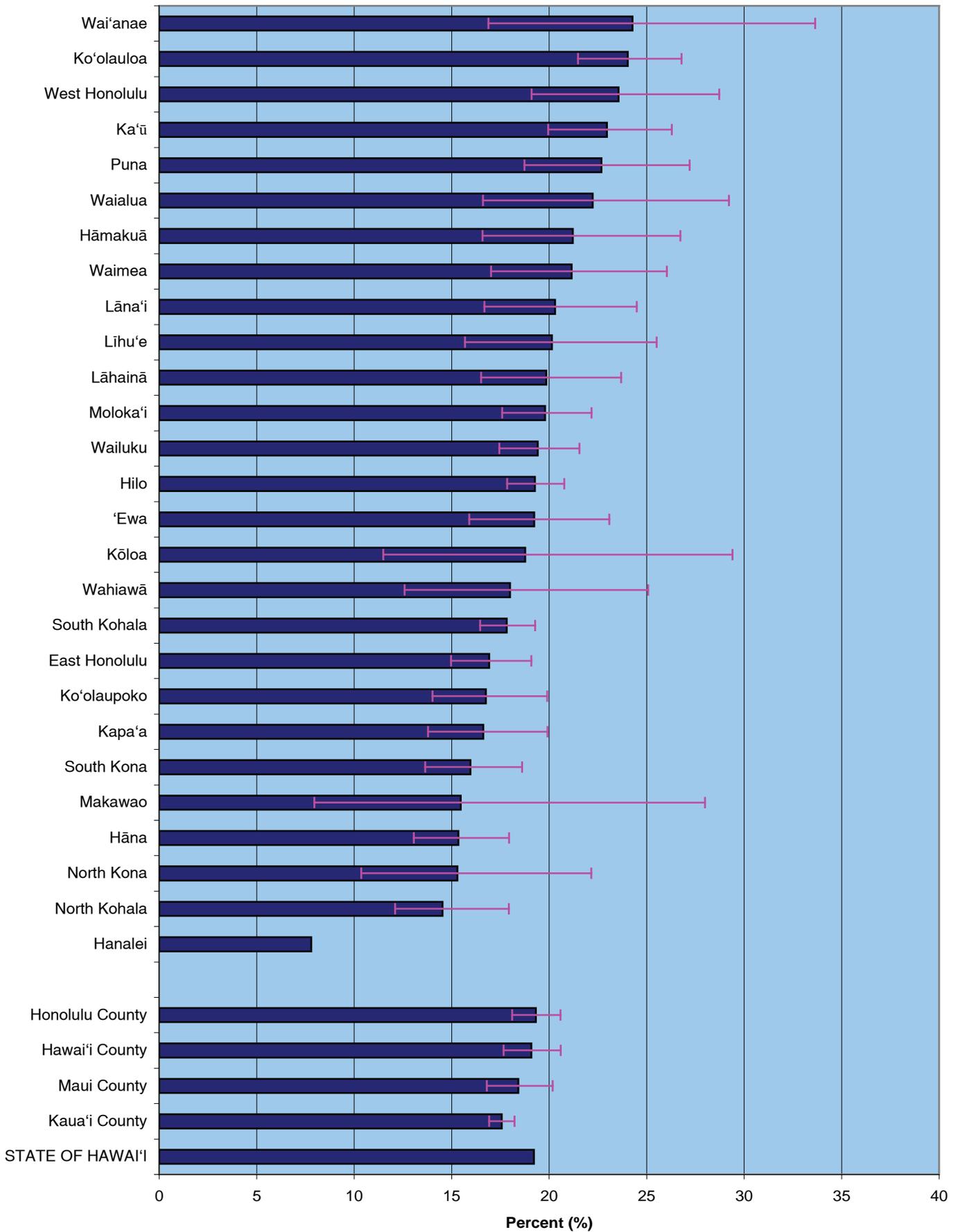


Table 20: Adults with Diabetes, 2003-2008

Service Area	Estimated Annual Adult Population	Estimated Annual Number of Adults with Diabetes	Percent of Adults with Diabetes (%)	95% Confidence Interval
State of Hawai'i	972,296	83,843	8.6	(8.2 - 9.1)
Honolulu County	675,898	59,584	8.8	(8.2 - 9.4)
East Honolulu	179,633	14,212	7.9	(7.0 - 9.0)
West Honolulu	91,218	6,408	7.0	(5.7 - 8.7)
'Ewa	226,409	19,940	8.8	(7.8 - 9.9)
Wahiawā	2,283	234	10.2	(5.6 - 18.1)
Wai'anae	36,743	6,017	16.4	(12.7 - 20.8)
Waialua	30,555	3,135	10.3	(7.5 - 13.9)
Ko'olauloa	10,402	877	8.4	(5.2 - 13.5)
Ko'olaupoko	98,656	8,762	8.9	(7.6 - 10.4)
Hawai'i County	120,804	10,563	8.7	(7.9 - 9.7)
Hilo	38,579	3,546	9.2	(7.9 - 10.7)
Puna	18,420	1,477	8.0	(6.2 - 10.3)
Ka'ū	14,734	1,741	11.8	(8.6 - 16.1)
South Kona	13,822	1,067	7.7	(5.9 - 10.0)
North Kona	20,615	1,202	5.8	(4.6 - 7.4)
South Kohala	3,792	214	5.7	(2.9 - 10.9)
North Kohala	4,048	432	10.7	(7.0 - 16.1)
Hāmakuā	6,794	883	13.0	(8.2 - 19.9)
Maui County	100,483	6,937	6.9	(6.1 - 7.8)
Hāna	1,784	88	4.9	(2.0 - 11.4)
Makawao	26,500	1,361	5.1	(4.0 - 6.6)
Wailuku	46,306	3,377	7.3	(6.1 - 8.7)
Lāhainā	13,402	1,119	8.4	(5.7 - 12.0)
Lāna'i	2,086	171	8.2	(6.4 - 10.5)
Moloka'i	10,403	821	7.9	(6.2 - 10.1)
Kaua'i County	45,170	3,901	8.6	(7.6 - 9.8)
Hanalei	5,048	200	4.0	(2.2 - 7.0)
Kapa'a	13,323	1,232	9.3	(7.3 - 11.6)
Līhu'e	9,544	1,079	11.3	(8.7 - 14.5)
Kōloa	10,058	873	8.7	(6.6 - 11.4)
Waimea	7,196	517	7.2	(5.0 - 10.2)

Source: State of Hawai'i, Department of Health, Behavioral Risk Factor Surveillance System (BRFSS)

Chart 26: Percent of Adults with Diabetes, 2003-2008

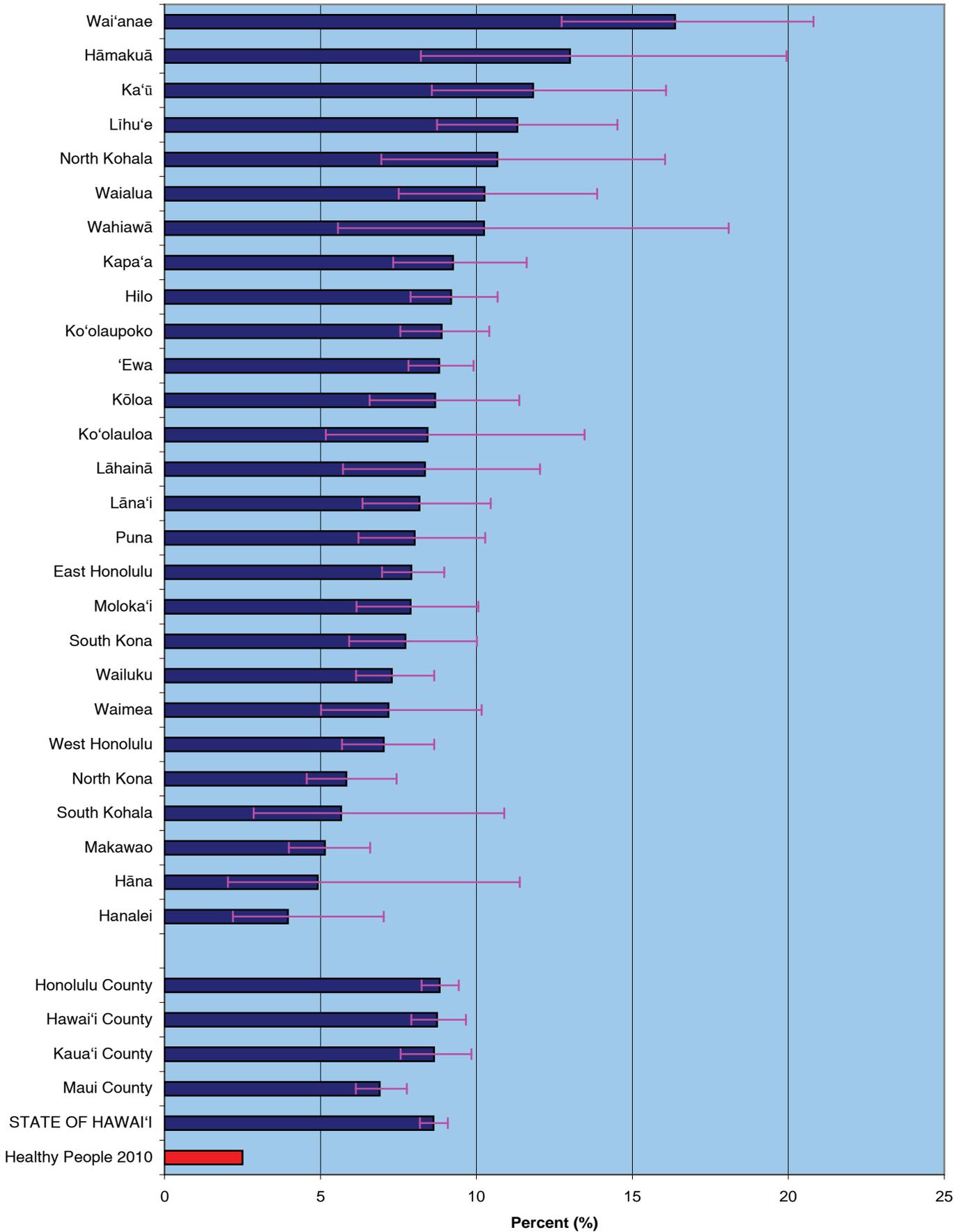


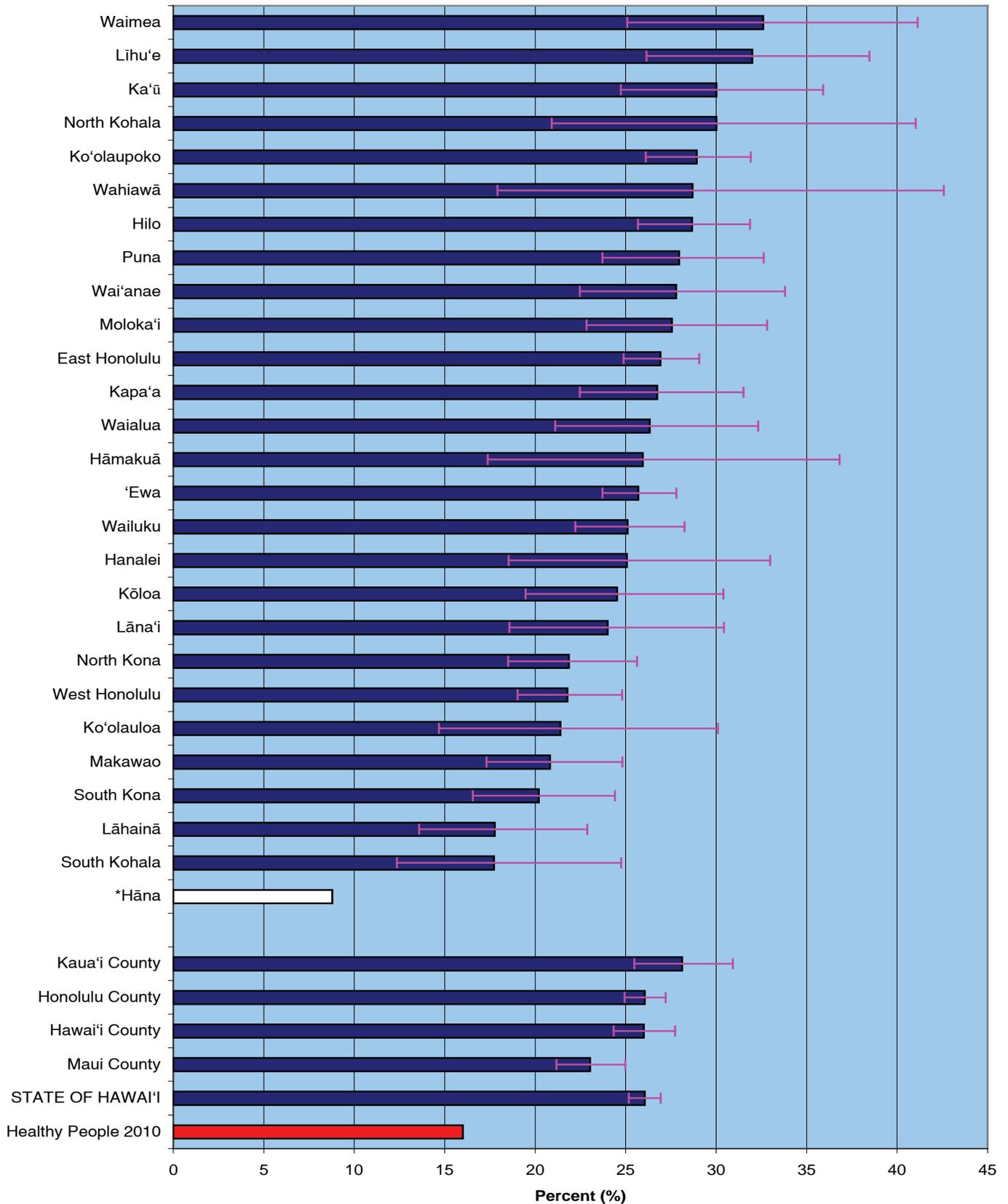
Table 21: Adults With High Blood Pressure 2003, 2005, and 2007

Service Area	Estimated Annual Adult Population	Estimated Annual Number of Adults with High Blood Pressure	Percent of Adults with High Blood Pressure (%)	95% Confidence Interval
State of Hawai'i	965,106	251,387	26.1	(25.2 - 26.9)
Honolulu County	681,105	177,509	26.1	(24.9 - 27.2)
East Honolulu	180,800	48,672	26.9	(24.9 - 29.1)
West Honolulu	92,256	20,092	21.8	(19.0 - 24.8)
'Ewa	224,950	57,817	25.7	(23.7 - 27.8)
Wahiawā	2,456	705	28.7	(17.9 - 42.6)
Wai'anae	37,175	10,328	27.8	(22.5 - 33.8)
Waialua	30,348	7,991	26.3	(21.1 - 32.3)
Ko'olauloa	10,861	2,325	21.4	(14.7 - 30.1)
Ko'olaupoko	102,259	29,579	28.9	(26.1 - 31.9)
Hawai'i County	116,992	30,415	26.0	(24.3 - 27.7)
Hilo	38,192	10,951	28.7	(25.7 - 31.9)
Puna	18,436	5,154	28.0	(23.7 - 32.6)
Ka'ū	11,217	3,368	30.0	(24.7 - 35.9)
South Kona	14,036	2,835	20.2	(16.6 - 24.4)
North Kona	21,221	4,638	21.9	(18.5 - 25.6)
South Kohala	3,652	647	17.7	(12.4 - 24.8)
North Kohala	4,072	1,222	30.0	(20.9 - 41.0)
Hāmakuā	6,166	1,599	25.9	(17.4 - 36.8)
Maui County	98,785	22,747	23.0	(21.2 - 25.0)
Hāna	1,411	124	8.8	---
Makawao	25,852	5,382	20.8	(17.3 - 24.8)
Wailuku	45,761	11,491	25.1	(22.2 - 28.3)
Lāhainā	12,927	2,296	17.8	(13.6 - 22.9)
Lāna'i	2,276	546	24.0	(18.6 - 30.4)
Moloka'i	10,559	2,909	27.6	(22.8 - 32.8)
Kaua'i County	44,073	12,394	28.1	(25.5 - 30.9)
Hanalei	5,057	1,268	25.1	(18.5 - 33.0)
Kapa'a	13,264	3,547	26.7	(22.5 - 31.5)
Līhu'e	8,997	2,879	32.0	(26.2 - 38.5)
Kōloa	9,449	2,317	24.5	(19.5 - 30.4)
Waimea	7,307	2,382	32.6	(25.1 - 41.1)

Source: State of Hawai'i, Department of Health, Behavioral Risk Factor Surveillance System (BRFSS)

No confidence intervals were computed when the denominator for which the estimate was based on was less than 50 due to data suppression standards for the BRFSS. Instead, standardized ratios were computed and found to be less than 200, implying that the rates were not significantly higher than those for the State of Hawai'i. See Family Health Outcomes Project (FHOP), *Guidelines for Using Federal Data Templates with Small Numbers* (May 1, 1997).

Chart 26: Percent of Adults with High Blood Pressure, 2003, 2005, and 2007



*Standardized ratios were computed and found to be less than 200, implying that the rates were not significantly higher than those for the State of Hawai'i. See Family Health Outcomes Project (FHOP), *Guidelines for Using Federal Data Templates with Small Numbers* (May 1, 1997). To avoid misinterpretation, these areas are low-lighted and should not be compared to colored bars. Refer to the discussion on the *Small Numbers Problem* in Chapter 1

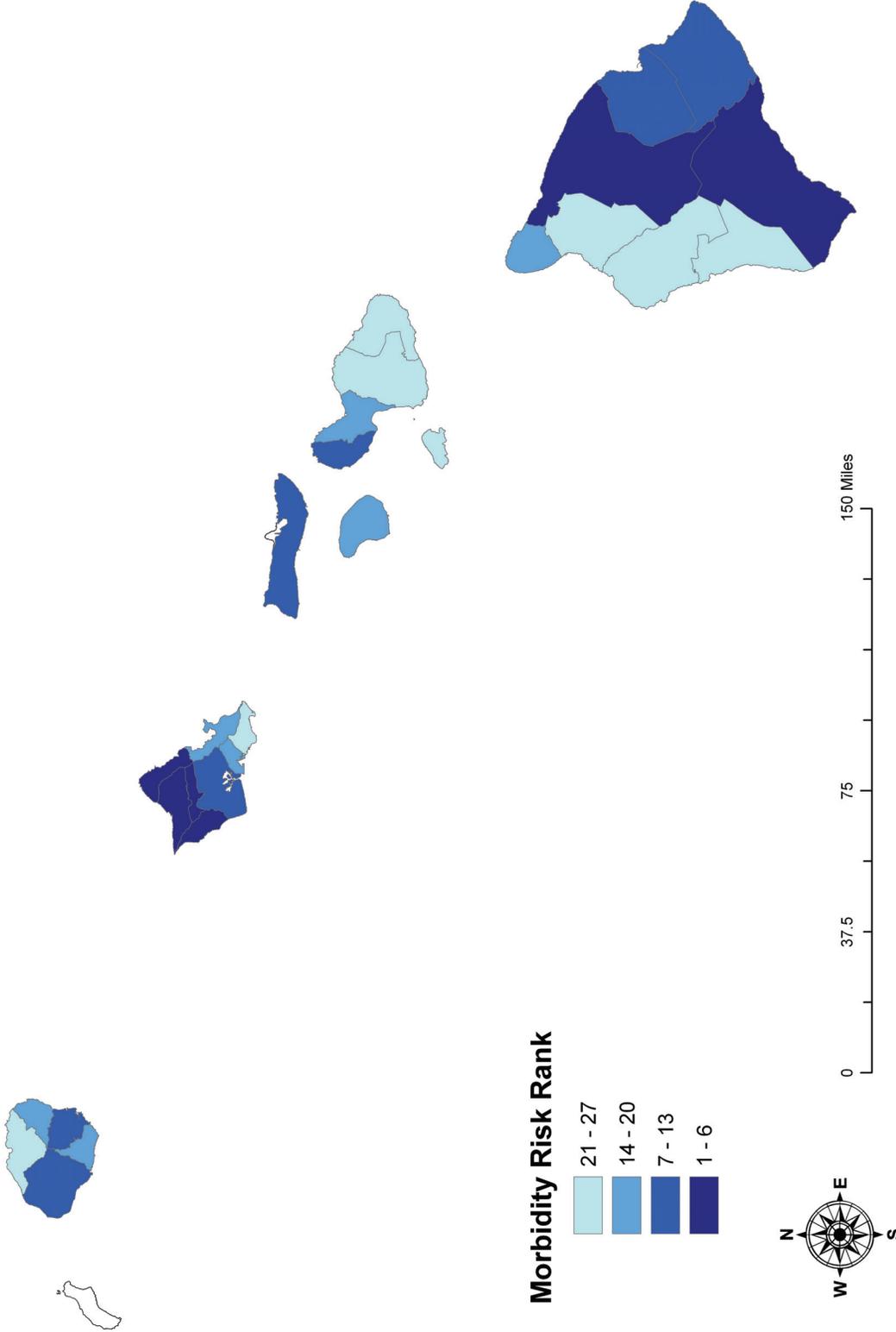
Table 22: Summary of Indicators for Morbidity Risk Index, 2003-2008

	Percent of Adults who are Obese (%)	Percent of Adults who Smoke (%)	Percent of Adults who are Heavy Drinkers (%)	Percent of Adults With No Physical Activity (%)	Percent of Adults with Diabetes (%)	Percent of Adults with High Blood Pressure*
State of Hawai'i	20.5	16.9	7.2	19.2	8.6	26.0
Honolulu County	20.4	16.2	6.7	19.3	8.8	26.1
East Honolulu	15.5	14.8	6.9	16.9	7.9	26.9
West Honolulu	17.2	17.3	5.7	23.6	7.0	21.8
'Ewa	20.8	15.7	5.9	19.2	8.8	25.7
Wahiawā	29.8	23.5	10.6	18.0	10.2	28.7
Wai'anae	39.6	27.0	10.8	24.3	16.4	27.8
Waialua	22.4	19.7	6.9	22.2	10.3	26.3
Ko'olauloa	31.7	22.5	6.1	24.0	8.4	21.4
Ko'olaupoko	22.3	13.3	7.7	16.7	8.9	28.9
Hawai'i County	21.7	19.1	8.3	19.1	8.7	26.0
Hilo	22.4	20.0	9.0	19.3	9.2	28.7
Puna	21.1	22.3	4.8	22.7	8.0	28.0
Ka'ū	26.3	21.8	8.7	23.0	11.8	30.0
South Kona	19.4	15.9	8.1	16.0	7.7	20.2
North Kona	18.8	14.9	9.6	15.3	5.8	21.9
South Kohala	17.2	16.9	9.7	17.8	5.7	17.7
North Kohala	21.5	22.4	12.4	14.5	10.7	30.0
Hāmakuā	25.7	17.4	6.0	21.2	13.0	25.9
Maui County	20.7	18.2	8.8	18.4	6.9	23.0
Hāna	20.1	21.5	12.7	15.4	4.9	8.8
Makawao	17.5	17.5	8.6	15.5	5.1	20.8
Wailuku	20.4	18.3	7.2	19.4	7.3	25.1
Lāhainā	23.6	19.7	11.9	19.9	8.4	17.8
Lāna'i	16.5	17.7	8.6	20.3	8.2	24.0
Moloka'i	27.6	17.4	11.7	19.8	7.9	27.5
Kaua'i County	20.6	17.9	7.9	17.6	8.6	28.1
Hanalei	15.1	12.7	9.2	7.8	4.0	25.1
Kapa'a	21.5	18.5	8.3	16.6	9.2	26.7
Līhu'e	20.0	17.5	5.7	20.2	11.3	32.0
Kōloa	18.5	16.4	8.6	18.8	8.7	24.5
Waimea	26.8	23.2	8.4	21.2	7.2	32.6

* Question only asked in 2003, 2005, and 2007

Table 23: Ranking Based on Morbidity Risk Index

Ranking of Service Areas by County			State-Wide Ranking of Service Areas		
Service Area	Risk Rank	Risk Score	Service Area	Risk Rank	Risk Score
Honolulu County (highest)			State of Hawai'i (highest)		
Wai'anae	1	7.6	Wai'anae	1	7.6
Ko'olauloa	2	3.1	Ka'ū	2	3.1
Wahiawā	3	1.8	Ko'olauloa	3	3.1
Waialua	4	1.6	Hāmakuā	4	3.0
'Ewa	5	-0.1	Wahiawā	5	1.8
West Honolulu	6	-0.2	Waialua	6	1.6
Ko'olaupoko	7	-0.5	Līhu'e	7	1.0
East Honolulu	8	-2.0	Moloka'i	8	1.0
(lowest)			Waimea	9	0.9
Hawai'i County (highest)			Puna	10	0.6
Ka'ū	1	3.1	Lāhainā	11	0.4
Hāmakuā	2	3.0	Hilo	12	0.4
Puna	3	0.6	'Ewa	13	-0.1
Hilo	4	0.4	West Honolulu	14	-0.2
North Kohala	5	-0.5	Ko'olaupoko	15	-0.5
South Kona	6	-1.6	Kapa'a	16	-0.5
South Kohala	7	-2.3	North Kohala	17	-0.5
North Kona	8	-2.7	Wailuku	18	-0.7
(lowest)			Kōloa	19	-0.7
Maui County (highest)			Lāna'i	20	-0.8
Moloka'i	1	1.0	South Kona	21	-1.6
Lāhainā	2	0.4	East Honolulu	22	-2.0
Wailuku	3	-0.7	South Kohala	23	-2.3
Lāna'i	4	-0.8	North Kona	24	-2.7
Hāna	5	-2.8	Hāna	25	-2.8
Makawao	6	-3.1	Makawao	26	-3.1
(lowest)			Hanalei	27	-6.1
Kaua'i County (highest)			(lowest)		
Līhu'e	1	1.0			
Waimea	2	0.9			
Kapa'a	3	-0.5			
Kōloa	4	-0.7			
Hanalei	5	-6.1			
(lowest)					



Map 10: Morbidity Risk Index by Primary Care Service Area

CHAPTER 6: MORTALITY

This section of the data book focuses on the distribution of the three leading causes of death (mortality) in the population. The International Statistical Classification of Diseases and Related Health Problems (most commonly known by the abbreviation ICD) provides codes to classify disease and a wide variety of signs, symptoms, abnormal findings, complaints, social circumstances and external causes of injury. Almost every health condition is assigned a unique category and given a code. The tenth version, or ICD 10, codes are used systematically in reporting statistics related to mortality by the National Centers for Health Statistics, the World Health Organization, and other entities. This data book used the underlying cause of death listed on the death certificate and categorized them to match the three leading causes of death published by the Office of Health Status and Monitoring in the Hawai'i Department of Health. The data depicted in this chapter are age adjusted to the population for each primary care service area and county. The total population is based on the 2000 U.S. Census for each area summed over 6 years (2003-2008). The adult risk factor index can be found in Table 27, Table 28, and in Map 11.

MORTALITY INDICATORS

The mortality indicators, using aggregated data from 2003-2008 were defined as follows:

Stroke (Cerebrovascular Disease) Mortality Rate	=	$\frac{\text{Number of persons with ICD 10 code in the range of I60-I69 for the underlying cause of death}}{\text{Total Population}}$
Diseases of the Heart Mortality Rate	=	$\frac{\text{Number of persons with ICD 10 code in the range of I00-I09, I11, I13, I20-I51 for the underlying cause of death}}{\text{Total Population}}$
Cancer (Malignant Neoplasm) Mortality Rate	=	$\frac{\text{Number of persons with ICD 10 code in the range of C00-C97 for the underlying cause of death}}{\text{Total Population}}$

Healthy People 2010

The Healthy People 2010 objectives for stroke and cancer mortality were included in our bar graph analysis in Charts 28 and 30. There is no directly corresponding objective for the codes used for mortality due to Diseases of the Heart presented in this report.

Table 24: Stroke (Cerebrovascular Disease*) Mortality Rate, 2003-2008

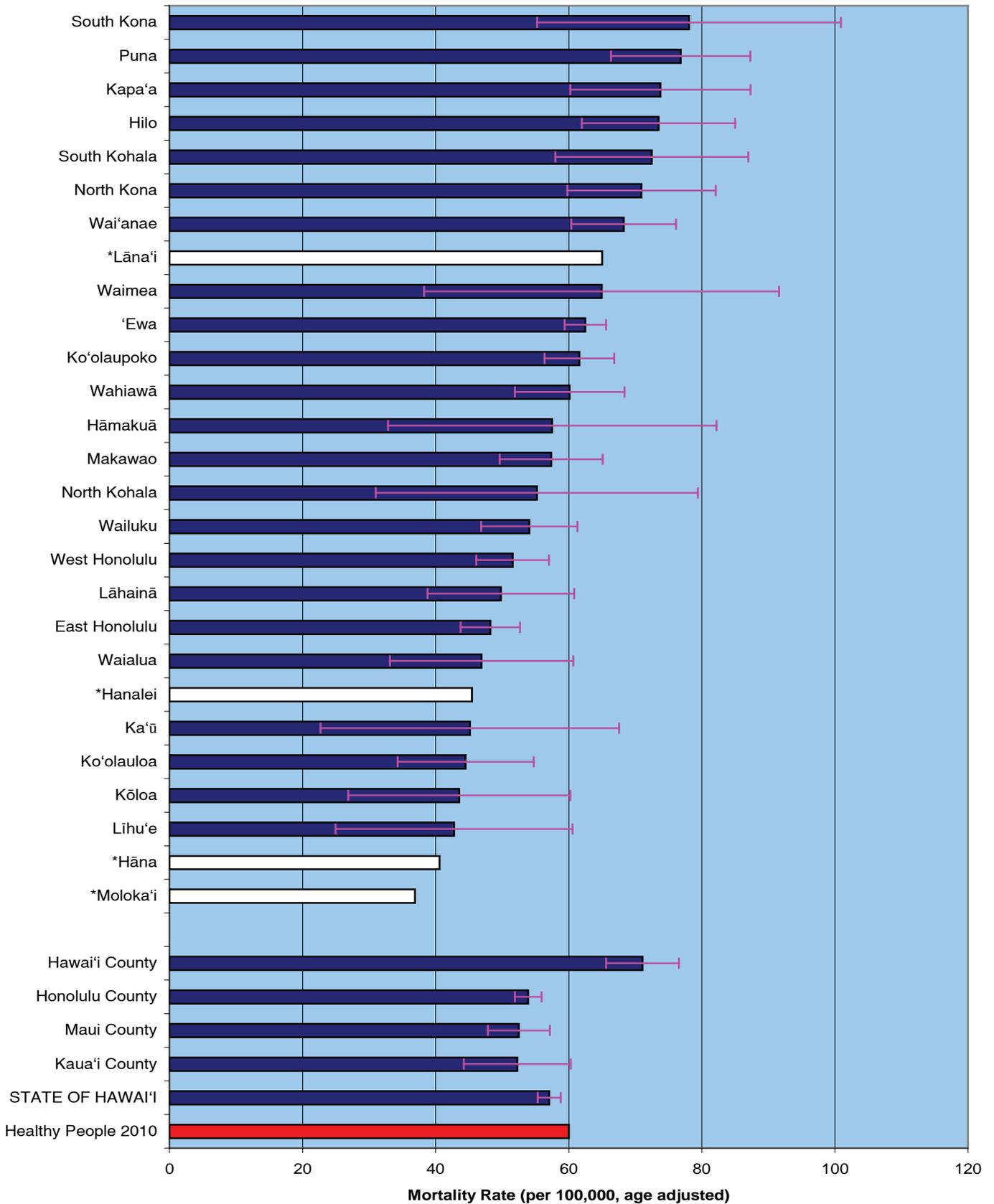
Service Area	Population	Number of Stroke Deaths	Age Adjusted Death Rate (per 100,000)	95% Confidence Interval
State of Hawai'i	7,269,222	4,136	57.1	(55.3 - 58.8)
Honolulu County	5,256,936	2,863	53.9	(51.9 - 55.9)
East Honolulu	1,429,806	1,059	48.2	(43.7 - 52.7)
West Honolulu	801,294	499	51.6	(46.1 - 57.0)
'Ewa	1,636,128	680	62.5	(59.4 - 65.6)
Wahiawā	230,220	94	60.1	(51.9 - 68.4)
Wai'anae	253,938	104	68.3	(60.4 - 76.1)
Waialua	84,162	35	46.9	(33.1 - 60.7)
Ko'olauloa	113,394	35	44.5	(34.3 - 54.7)
Ko'olaupoko	707,994	358	61.6	(56.4 - 66.8)
Hawai'i County	892,062	622	71.1	(65.6 - 76.6)
Hilo	284,316	279	73.5	(62.0 - 85.0)
Puna	188,010	101	76.8	(66.4 - 87.3)
Ka'ū	34,962	16	45.1	(22.7 - 67.6)
South Kona	51,534	36	78.1	(55.3 - 100.9)
North Kona	171,258	95	70.9	(59.8 - 82.1)
South Kohala	78,786	34	72.5	(58.0 - 87.0)
North Kohala	36,228	20	55.2	(31.0 - 79.4)
Hāmakuā	46,968	35	57.5	(32.8 - 82.2)
Maui County	769,446	335	52.5	(47.8 - 57.2)
Hāna	11,130	4	40.6	---
Makawao	218,856	75	57.4	(49.6 - 65.1)
Wailuku	367,824	184	54.1	(46.8 - 61.3)
Lāhainā	108,054	37	49.8	(38.8 - 60.8)
Lāna'i	19,158	13	65.0	---
Moloka'i	43,542	17	36.9	---
Kaua'i County	350,778	207	52.3	(44.2 - 60.3)
Hanalei	38,088	12	45.5	---
Kapa'a	111,150	59	73.8	(60.2 - 87.3)
Līhu'e	72,132	43	42.8	(25.0 - 60.6)
Kōloa	77,070	43	43.6	(26.9 - 60.2)
Waimea	51,408	49	64.9	(38.3 - 91.6)

*Cerebrovascular Diseases ... ICD_10 Codes: 160-169

Source: State of Hawai'i, Department of Health, Office of Health Status Monitoring

No confidence intervals were computed when the number of events were less than 20. Instead, standardized ratios were computed and found to be less than 200, implying that the rates were not significantly higher than those for the State of Hawai'i. See Family Health Outcomes Project (FHOP), *Guidelines for Using Federal Data Templates with Small Numbers* (May 1, 1997).

Chart 28: Stroke (Cerebrovascular Disease) Mortality Rate, 2003-2008



*Standardized ratios were computed and found to be less than 200, implying that the rates were not significantly higher than those for the State of Hawai'i. See Family Health Outcomes Project (FHOP), *Guidelines for Using Federal Data Templates with Small Numbers* (May 1, 1997). To avoid misinterpretation, these areas are low-lighted and should not be compared to colored bars. Refer to the discussion on the *Small Numbers Problem* in Chapter 1.

Table 25: Diseases of the Heart* Mortality Rate, 2003-2008

Service Area	Population	Number of Deaths Due to Diseases of the Heart	Age Adjusted Death Rate (per 100,000)	95% Confidence Interval
State of Hawai'i	7,269,222	14,437	197.9	(194.7 - 201.1)
Honolulu County	5,256,936	9,603	180.1	(176.4 - 183.7)
East Honolulu	1,429,806	3,217	149.4	(141.6 - 157.2)
West Honolulu	801,294	1,572	165.7	(156.0 - 175.4)
'Ewa	1,636,128	2,511	222.5	(216.5 - 228.5)
Wahiawā	230,220	275	182.9	(168.8 - 197.0)
Wai'anae	253,938	598	370.7	(351.9 - 389.6)
Waialua	84,162	110	149.6	(125.2 - 174.0)
Ko'olauloa	113,394	167	219.2	(196.9 - 241.5)
Ko'olaupoko	707,994	1,124	191.8	(182.5 - 201.0)
Hawai'i County	892,062	2,094	235.0	(224.9 - 245.0)
Hilo	284,316	878	236.5	(216.1 - 256.9)
Puna	188,010	389	285.3	(264.8 - 305.8)
Ka'ū	34,962	93	246.1	(192.1 - 300.1)
South Kona	51,534	122	252.6	(210.6 - 294.6)
North Kona	171,258	289	212.7	(193.3 - 232.1)
South Kohala	78,786	134	276.6	(247.8 - 305.3)
North Kohala	36,228	52	145.7	(106.7 - 184.7)
Hāmakuā	46,968	132	214.9	(167.0 - 262.7)
Maui County	769,446	1,380	212.1	(202.7 - 221.6)
Hāna	11,130	24	281.1	(194.9 - 367.3)
Makawao	218,856	320	223.8	(207.8 - 239.9)
Wailuku	367,824	746	215.8	(201.3 - 230.4)
Lāhainā	108,054	161	214.1	(191.1 - 237.1)
Lāna'i	19,158	36	176.8	(115.5 - 238.2)
Moloka'i	43,542	85	188.5	(147.1 - 230.0)
Kaua'i County	350,778	692	174.8	(160.1 - 189.5)
Hanalei	38,088	47	164.3	(129.0 - 199.5)
Kapa'a	111,150	199	237.1	(212.3 - 262.0)
Līhu'e	72,132	186	179.9	(142.8 - 216.9)
Kōloa	77,070	165	163.1	(130.5 - 195.8)
Waimea	51,408	90	136.1	(100.0 - 172.3)

*Diseases of the Heart ... ICD_10 Codes: I00-I09, I11, I13, I20-I51

Source: State of Hawai'i, Department of Health, Office of Health Status Monitoring

Chart 29: Diseases of the Heart Mortality Rate, 2003-2008

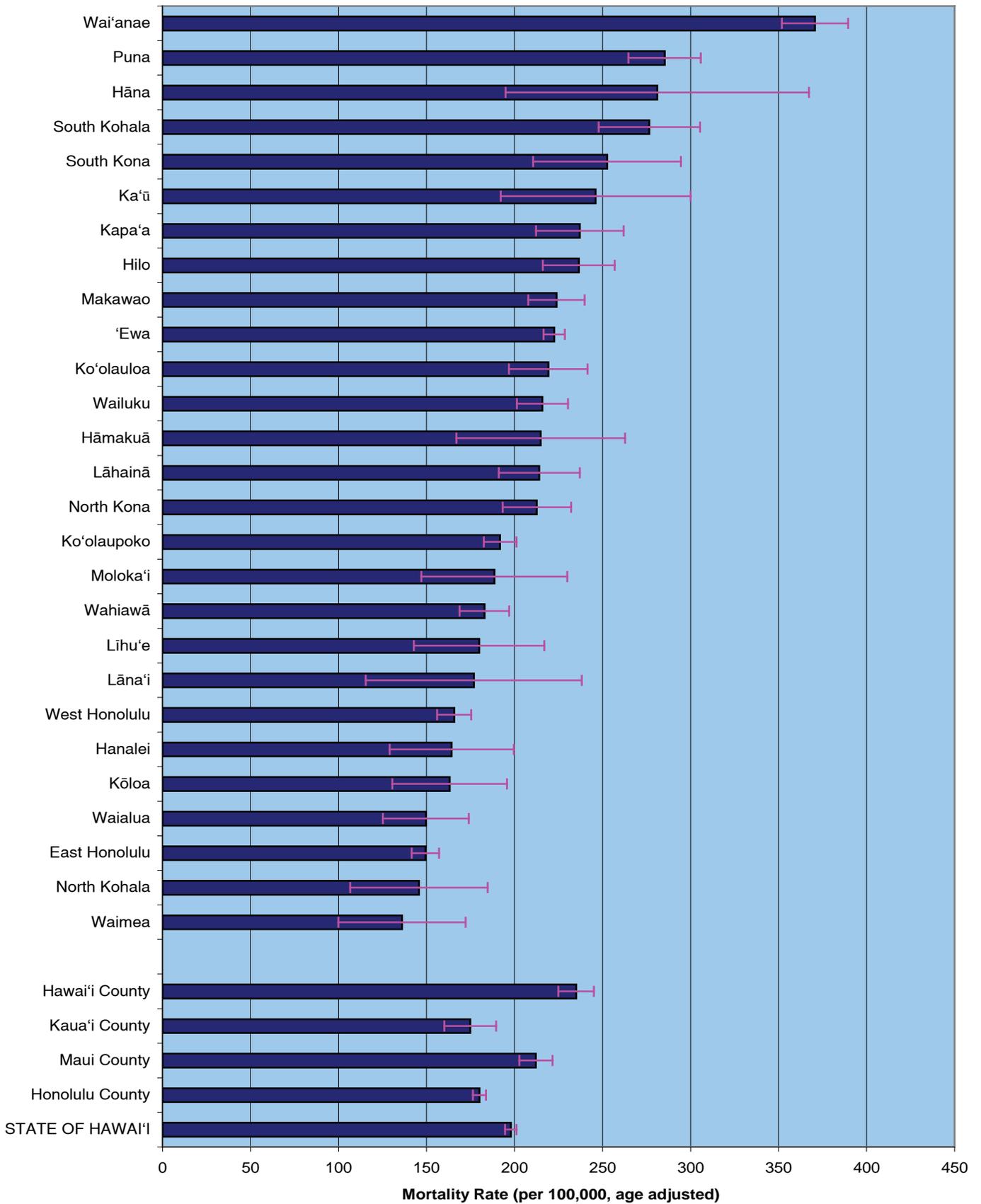


Table 26: Cancer (Malignant Neoplasm*) Mortality Rate, 2003-2008

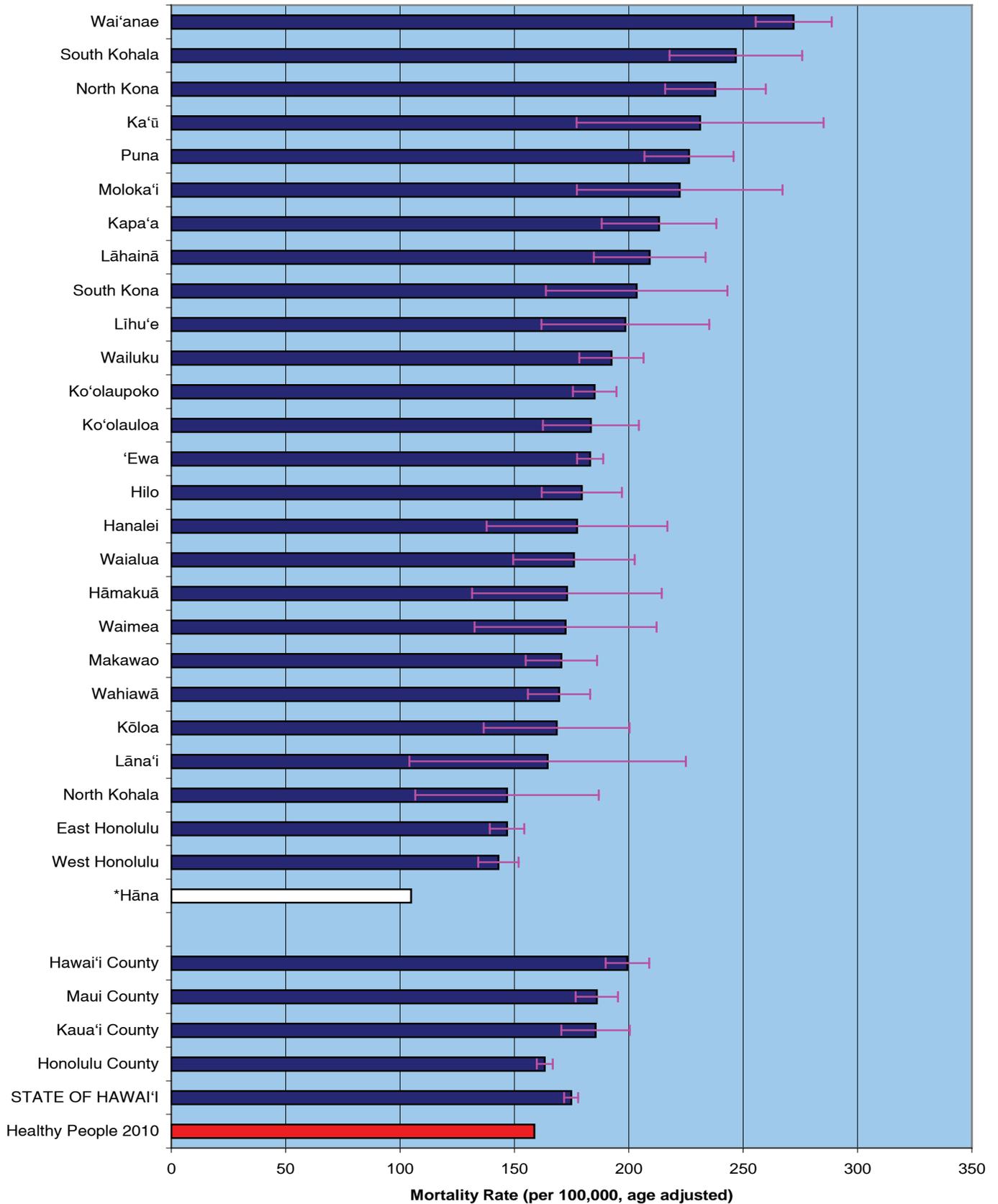
Service Area	Population	Number of Cancer Deaths	Age Adjusted Death Rate (per 100,000)	95% Confidence Interval
State of Hawai'i	7,269,222	13,022	174.8	(171.7 - 177.9)
Honolulu County	5,256,936	8,823	163.2	(159.7 - 166.7)
East Honolulu	1,429,806	3,030	146.8	(139.2 - 154.3)
West Honolulu	801,294	1,302	143.0	(134.2 - 151.9)
'Ewa	1,636,128	2,295	183.1	(177.4 - 188.9)
Wahiawā	230,220	255	169.5	(156.0 - 183.1)
Wai'anae	253,938	462	272.1	(255.5 - 288.7)
Waialua	84,162	130	176.0	(149.5 - 202.5)
Ko'olauloa	113,394	147	183.4	(162.5 - 204.4)
Ko'olaupoko	707,994	1,186	185.1	(175.6 - 194.6)
Hawai'i County	892,062	1,865	199.4	(189.9 - 208.9)
Hilo	284,316	646	179.4	(161.9 - 197.0)
Puna	188,010	349	226.4	(206.9 - 245.8)
Ka'ū	34,962	93	231.2	(177.2 - 285.2)
South Kona	51,534	109	203.5	(163.8 - 243.1)
North Kona	171,258	369	237.9	(215.9 - 259.9)
South Kohala	78,786	136	246.8	(217.8 - 275.8)
North Kohala	36,228	55	146.8	(106.7 - 186.9)
Hāmakuā	46,968	99	173.0	(131.5 - 214.5)
Maui County	769,446	1,326	186.0	(176.8 - 195.3)
Hāna	11,130	11	104.8	---
Makawao	218,856	302	170.5	(155.0 - 186.1)
Wailuku	367,824	691	192.4	(178.4 - 206.4)
Lāhainā	108,054	181	209.1	(184.7 - 233.5)
Lāna'i	19,158	35	164.5	(104.0 - 225.0)
Moloka'i	43,542	100	222.3	(177.3 - 267.3)
Kaua'i County	350,778	714	185.5	(170.6 - 200.4)
Hanalei	38,088	59	177.4	(137.9 - 216.9)
Kapa'a	111,150	202	213.2	(188.2 - 238.3)
Līhu'e	72,132	183	198.5	(161.8 - 235.2)
Kōloa	77,070	157	168.4	(136.6 - 200.3)
Waimea	51,408	109	172.4	(132.6 - 212.1)

*Malignant Neoplasm ... ICD_10 Codes: C00-C97

Source: State of Hawai'i, Department of Health, Office of Health Status Monitoring

No confidence intervals were computed when the number of events were less than 20. Instead, standardized ratios were computed and found to be less than 200, implying that the rates were not significantly higher than those for the State of Hawai'i. See Family Health Outcomes Project (FHOP), *Guidelines for Using Federal Data Templates with Small Numbers* (May 1, 1997).

Chart 30: Cancer (Malignant Neoplasm) Mortality Rate, 2003-2008



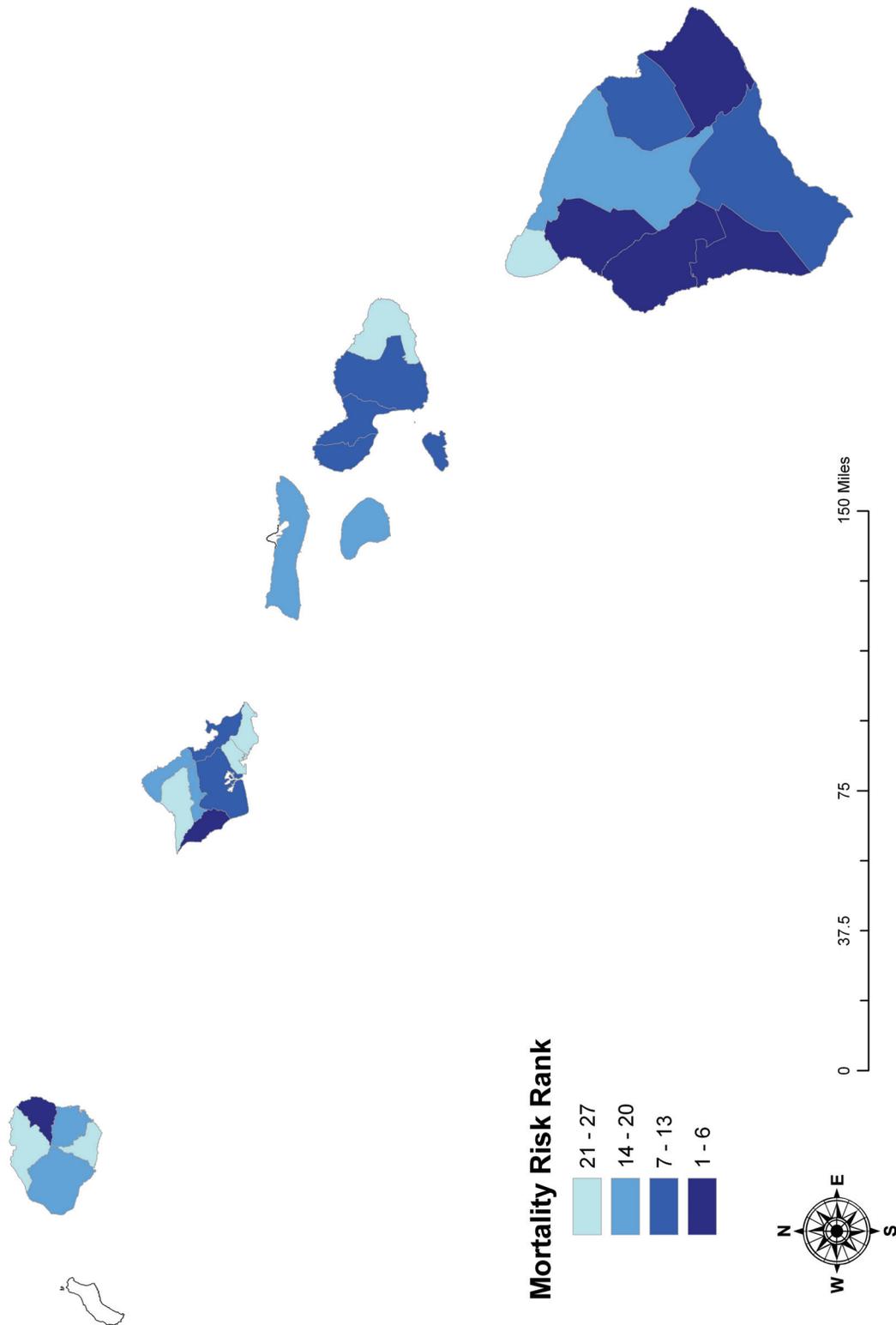
*Standardized ratios were computed and found to be less than 200, implying that the rates were not significantly higher than those for the State of Hawai'i. See Family Health Outcomes Project (FHOP), *Guidelines for Using Federal Data Templates with Small Numbers* (May 1, 1997). To avoid misinterpretation, these areas are low-lighted and should not be compared to colored bars. Refer to the discussion on the *Small Numbers Problem* in Chapter 1.

Table 27: Summary of Indicators for Mortality Risk Index, 2003-2008

Service Area	Stroke (Cerebrovascular Disease) Mortality Rate (per 100,000)	Diseases of the Heart Mortality Rate (per 100,000)	Cancer (Malignant Neoplasm) Mortality Rate (per 100,000)
State of Hawai'i	57.1	197.9	174.8
Honolulu County	53.9	180.1	163.2
East Honolulu	48.2	149.4	146.8
West Honolulu	51.6	165.7	143.0
'Ewa	62.5	222.5	183.1
Wahiawā	60.1	182.9	169.5
Wai'anae	68.3	370.7	272.1
Waialua	46.9	149.6	176.0
Ko'olauloa	44.5	219.2	183.4
Ko'olaupoko	61.6	191.8	185.1
Hawai'i County	71.1	235.0	199.4
Hilo	73.5	236.5	179.4
Puna	76.8	285.3	226.4
Ka'ū	45.1	246.1	231.2
South Kona	78.1	252.6	203.5
North Kona	70.9	212.7	237.9
South Kohala	72.5	276.6	246.8
North Kohala	55.2	145.7	146.8
Hāmakuā	57.5	214.9	173.0
Maui County	52.5	212.1	186.0
Hāna	40.6	281.1	104.8
Makawao	57.4	223.8	170.5
Wailuku	54.1	215.8	192.4
Lāhainā	49.8	214.1	209.1
Lāna'i	65.0	176.8	164.5
Moloka'i	36.9	188.5	222.3
Kaua'i County	52.3	174.8	185.5
Hanalei	45.5	164.3	177.4
Kapa'a	73.8	237.1	213.2
Līhu'e	42.8	179.9	198.5
Kōloa	43.6	163.1	168.4
Waimea	64.9	136.1	172.4

Table 28: Ranking Based on Mortality Risk Index

Ranking of Service Areas by County			State-Wide Ranking of Service Areas		
Service Area	Risk Rank	Risk Score	Service Area	Risk Rank	Risk Score
Honolulu County (highest)			State of Hawai'i (highest)		
Wai'anae	1	6.2	Wai'anae	1	6.2
'Ewa	2	0.5	South Kohala	2	4.1
Ko'olaupoko	3	-0.1	Puna	3	4.0
Wahiawā	4	-0.8	South Kona	4	2.9
Ko'olauloa	5	-1.0	Kapa'a	5	2.5
Waialua	6	-2.4	North Kona	6	2.5
West Honolulu	7	-2.6	Hilo	7	1.5
East Honolulu	8	-3.1	Ka'ū	8	0.8
(lowest)			'Ewa	9	0.5
Hawai'i County (highest)			Lāhainā	10	0.0
South Kohala	1	4.1	Wailuku	11	-0.1
Puna	2	4.0	Ko'olaupoko	12	-0.1
South Kona	3	2.9	Makawao	13	-0.3
North Kona	4	2.5	Hāmakuā	14	-0.4
Hilo	5	1.5	Lāna'i	15	-0.7
Ka'ū	6	0.8	Wahiawā	16	-0.8
Hāmakuā	7	-0.4	Ko'olauloa	17	-1.0
North Kohala	8	-2.6	Moloka'i	18	-1.2
(lowest)			Waimea	19	-1.3
Maui County (highest)			Līhu'e	20	-1.5
Lāhainā	1	0.0	Hanalei	21	-2.2
Wailuku	2	-0.1	Waialua	22	-2.4
Makawao	3	-0.3	Hāna	23	-2.4
Lāna'i	4	-0.7	North Kohala	24	-2.6
Moloka'i	5	-1.2	Kōloa	25	-2.6
Hāna	6	-2.4	West Honolulu	26	-2.6
(lowest)			East Honolulu	27	-3.1
Kaua'i County (highest)			(lowest)		
Kapa'a	1	2.5			
Waimea	2	-1.3			
Līhu'e	3	-1.5			
Hanalei	4	-2.2			
Kōloa	5	-2.6			
(lowest)					



Map 11: Mortality Risk Index by Primary Care Service Area

CHAPTER 7: ADULT ORAL HEALTH

This section of the data book updates the indicators, based on the Behavioral Risk Factor Surveillance System (BRFSS) survey, for adult oral health and the corresponding index that was first presented in the 2005 edition of the data book. Oral health is an essential and integral component of health throughout life. Poor oral health can result in significant illness, disease, and even death. Poor oral health is associated with increased health care costs, increased absenteeism, and decreased productivity. People who do not receive regular professional care can develop oral disease that require complex restorative treatment, lead to tooth loss, and contribute to health problems. Routine dental visits provide an opportunity for early diagnosis, prevention, and treatment of oral disease. The adult oral health risk index is presented in Table 32, Table 33, and in Map 12.

ADULT ORAL HEALTH INDICATORS

The adult oral health indicators use aggregated data from the 2004, 2006, and 2008 BRFSS survey and are defined as follows:

Adults Who Did Not Visit a Dentist Within the Past Year	=	Self-report that their last visit to a dentist or dental clinic for any reason, including visits to specialists such as orthodontists, has been longer than one year ago.
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Adults Who Ever Had Any Permanent Teeth Removed	=	Self-report of having had permanent teeth removed due to tooth decay or gum disease. Does not include teeth removed due to injury or orthodontia.
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Adults Who Did Not Have Their Teeth Cleaned Within the Past Year	=	Self-report that their last teeth cleaning by a dentist or dental hygienist has been longer than one year ago.
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Table 29: Adults Who Did Not Visit a Dentist Within the Past Year, 2004, 2006, and 2008

Service Area	Estimated Annual Adult Population	Estimated Annual Number of Adults Who Did Not Visit a Dentist Within the Past Year	Percent Adults Who Did Not Visit a Dentist Within the Past Year (%)	95% Confidence Interval
State of Hawai'i	981,011	239,672	24.4	(23.4 - 25.5)
Honolulu County	671,219	154,607	23.0	(21.6 - 24.5)
East Honolulu	178,740	35,078	19.6	(17.4 - 22.1)
West Honolulu	90,166	25,743	28.6	(24.2 - 33.4)
'Ewa	228,129	47,387	20.8	(18.6 - 23.2)
Wahiawā	2,110	837	39.6	(22.1 - 60.4)
Wai'anae	36,311	14,154	39.0	(31.5 - 47.0)
Waialua	30,842	7,322	23.7	(16.9 - 32.3)
Ko'olauloa	9,999	3,111	31.1	(20.7 - 43.9)
Ko'olaupoko	94,922	20,974	22.1	(18.6 - 26.0)
Hawai'i County	124,907	35,930	28.8	(26.6 - 31.0)
Hilo	39,045	10,790	27.6	(24.0 - 31.6)
Puna	18,398	5,653	30.7	(25.8 - 36.1)
Ka'ū	18,252	6,149	33.7	(26.9 - 41.2)
South Kona	13,620	4,176	30.7	(24.3 - 37.9)
North Kona	20,047	4,617	23.0	(18.8 - 27.9)
South Kohala	3,993	1,430	35.8	(24.4 - 49.2)
North Kohala	4,095	680	16.6	(9.7 - 27.0)
Hāmakuā	7,459	2,436	32.7	(24.0 - 42.6)
Maui County	102,334	26,925	26.3	(23.9 - 28.9)
Hāna	2,158	560	25.9	(13.2 - 44.7)
Makawao	27,149	8,159	30.1	(24.9 - 35.7)
Wailuku	46,922	11,691	24.9	(21.5 - 28.7)
Lāhainā	13,922	2,921	21.0	(15.7 - 27.4)
Lāna'i	1,921	597	31.1	(25.6 - 37.2)
Moloka'i	10,263	2,997	29.2	(23.3 - 35.9)
Kaua'i County	46,528	13,638	29.3	(26.3 - 32.6)
Hanalei	5,060	1,361	26.9	(19.6 - 35.8)
Kapa'a	13,514	4,585	33.9	(28.2 - 40.2)
Līhu'e	10,129	2,578	25.5	(19.6 - 32.3)
Kōloa	10,740	2,840	26.4	(20.8 - 33.0)
Waimea	7,086	2,274	32.1	(23.5 - 42.1)

Source: State of Hawai'i, Department of Health, Behavioral Risk Assessment Monitoring System (BRFSS)

Chart 31: Percent of Adults Who Did Not Visit a Dentist Within the Past Year, 2004, 2006, and 2008

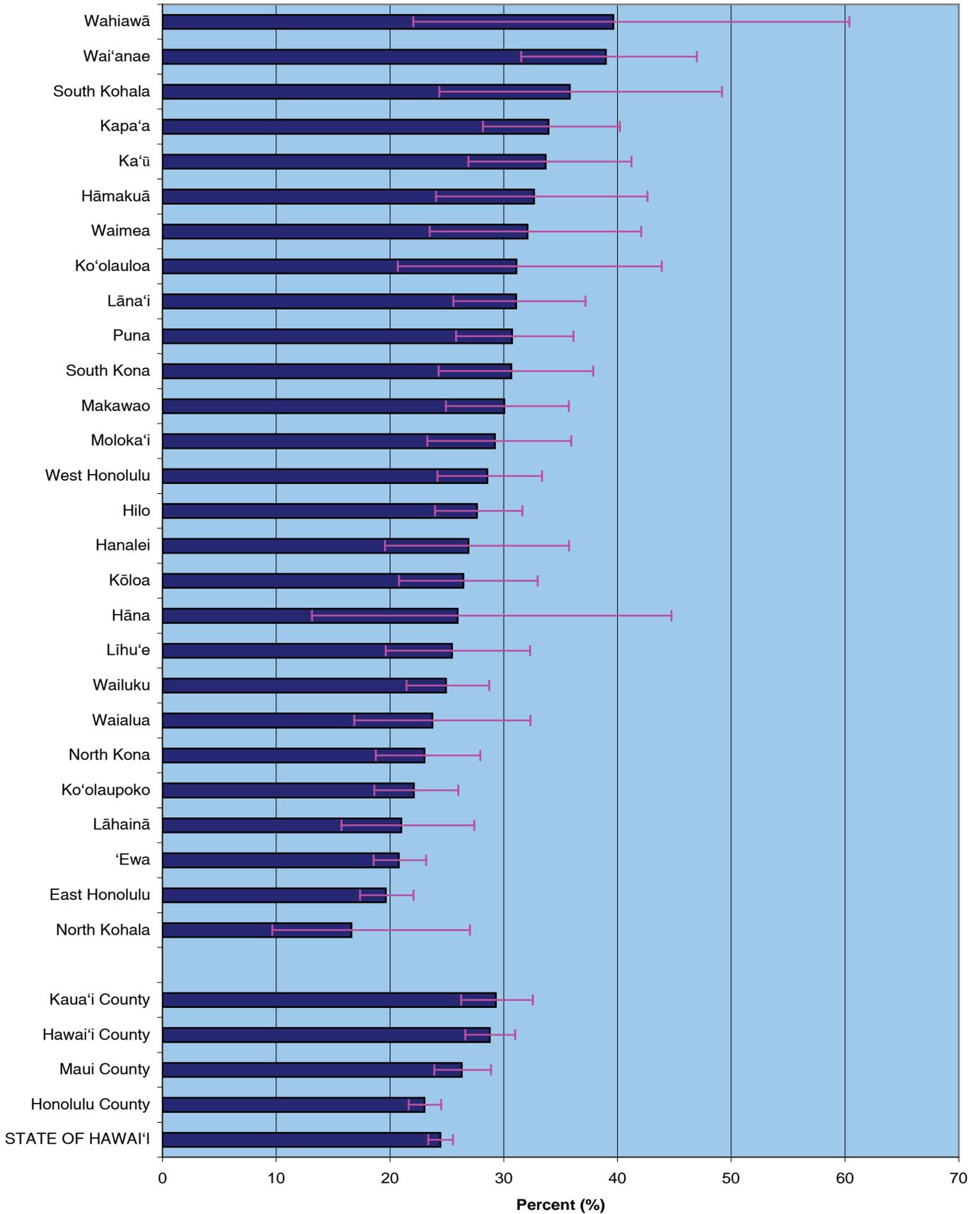


Table 30: Adults Who Ever Had Any Permanent Teeth Removed, 2004, 2006, and 2008

Service Area	Estimated Annual Adult Population	Estimated Annual Number of Adults Who Ever Had Any Permanent Teeth Removed	Percent of Adults Who Ever Had Any Permanent Teeth Removed (%)	95% Confidence Interval
State of Hawai'i	981,011	402,586	41.0	(39.8 - 42.3)
Honolulu County	671,219	268,805	40.0	(38.4 - 41.7)
East Honolulu	178,740	70,373	39.4	(36.5 - 42.3)
West Honolulu	90,166	38,452	42.6	(38.0 - 47.4)
'Ewa	228,129	88,406	38.8	(35.9 - 41.7)
Wahiawā	2,110	1,006	47.7	(29.1 - 66.9)
Wai'anae	36,311	17,137	47.2	(39.3 - 55.3)
Waialua	30,842	12,310	39.9	(32.1 - 48.3)
Ko'olauloa	9,999	4,889	48.9	(36.2 - 61.8)
Ko'olaupoko	94,922	36,232	38.2	(34.2 - 42.3)
Hawai'i County	124,907	56,578	45.3	(42.9 - 47.7)
Hilo	39,045	16,302	41.8	(37.8 - 45.8)
Puna	18,398	8,468	46.0	(40.4 - 51.8)
Ka'ū	18,252	8,549	46.8	(39.2 - 54.6)
South Kona	13,620	6,961	51.1	(43.9 - 58.3)
North Kona	20,047	8,627	43.0	(37.9 - 48.4)
South Kohala	3,993	1,710	42.8	(31.4 - 55.1)
North Kohala	4,095	1,896	46.3	(33.7 - 59.4)
Hāmakuā	7,459	4,063	54.5	(44.6 - 64.1)
Maui County	102,334	42,633	41.7	(38.9 - 44.5)
Hāna	2,158	1,064	49.3	(30.7 - 68.1)
Makawao	27,149	10,776	39.7	(34.5 - 45.2)
Wailuku	46,922	19,213	40.9	(36.6 - 45.4)
Lāhainā	13,922	6,500	46.7	(38.7 - 54.9)
Lāna'i	1,921	882	45.9	(39.1 - 52.9)
Moloka'i	10,263	4,197	40.9	(34.7 - 47.4)
Kaua'i County	46,528	18,026	38.7	(35.6 - 42.0)
Hanalei	5,060	1,766	34.9	(26.9 - 43.8)
Kapa'a	13,514	5,262	38.9	(33.5 - 44.7)
Līhu'e	10,129	3,742	36.9	(30.6 - 43.8)
Kōloa	10,740	4,298	40.0	(33.7 - 46.7)
Waimea	7,086	2,959	41.8	(32.0 - 52.2)

Source: State of Hawai'i, Department of Health, Behavioral Risk Assessment Monitoring System (BRFSS)

Chart 32: Percent of Adults Who Ever Had Any Permanent Teeth Removed, 2004, 2006, and 2008

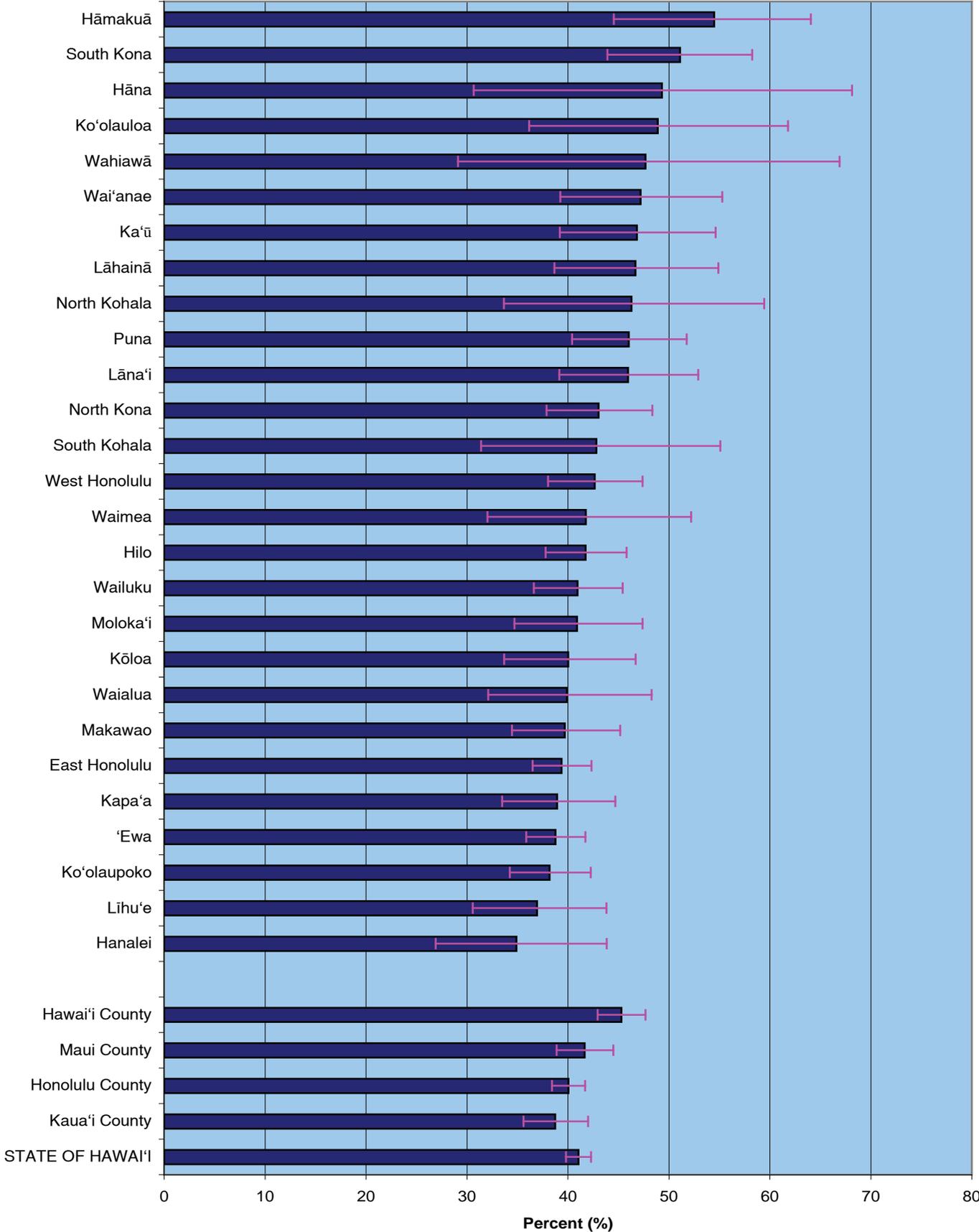


Table 31: Adults Who Did Not Have Their Teeth Cleaned Within the Past Year, 2004, 2006, and 2008

Service Area	Estimated Annual Adult Population	Estimated Annual Number of Adults Who Did Not Have Their Teeth Cleaned Within the Past Year	Percent of Adults Who Did Not Have Their Teeth Cleaned Within the Past Year (%)	95% Confidence Interval
State of Hawai'i	951,522	259,560	27.3	(26.1 - 28.5)
Honolulu County	652,365	166,143	25.5	(24.0 - 27.0)
East Honolulu	174,149	39,857	22.9	(20.3 - 25.8)
West Honolulu	86,664	24,951	28.8	(24.3 - 33.7)
'Ewa	222,477	52,411	23.6	(21.1 - 26.2)
Wahiawā	2,091	870	41.6	(23.7 - 62.1)
Wai'anae	34,661	13,559	39.1	(31.5 - 47.3)
Waialua	30,006	7,753	25.8	(18.7 - 34.6)
Ko'olauloa	9,838	3,160	32.1	(21.4 - 45.1)
Ko'olaupoko	92,479	23,582	25.5	(21.7 - 29.7)
Hawai'i County	121,527	41,390	34.1	(31.8 - 36.4)
Hilo	38,142	11,931	31.3	(27.4 - 35.5)
Puna	17,907	6,655	37.2	(31.8 - 42.9)
Ka'ū	17,534	6,911	39.4	(32.1 - 47.3)
South Kona	13,159	5,340	40.6	(33.3 - 48.3)
North Kona	19,730	5,448	27.6	(22.9 - 32.9)
South Kohala	3,945	1,595	40.4	(28.6 - 53.5)
North Kohala	4,062	1,002	24.7	(15.5 - 36.8)
Hāmakuā	7,047	2,508	35.6	(26.5 - 45.9)
Maui County	99,599	29,866	30.0	(27.4 - 32.8)
Hāna	2,158	728	33.7	(18.9 - 52.7)
Makawao	26,499	8,293	31.3	(26.1 - 37.0)
Wailuku	45,473	13,444	29.6	(25.6 - 33.9)
Lāhainā	13,624	3,437	25.2	(19.0 - 32.7)
Lāna'i	1,871	655	35.0	(29.1 - 41.4)
Moloka'i	9,974	3,309	33.2	(27.0 - 40.1)
Kaua'i County	45,001	14,148	31.4	(28.3 - 34.8)
Hanalei	4,813	1,438	29.9	(22.2 - 38.9)
Kapa'a	13,090	4,789	36.6	(30.7 - 42.9)
Līhu'e	9,766	2,718	27.8	(21.7 - 35.0)
Kōloa	10,526	2,897	27.5	(21.8 - 34.1)
Waimea	6,806	2,306	33.9	(25.1 - 43.9)

Source: State of Hawai'i, Department of Health, Behavioral Risk Assessment Monitoring System (BRFSS)

Chart 33: Percent of Adults Who Did Not Have Their Teeth Cleaned Within the Past Year, 2004, 2006, and 2008

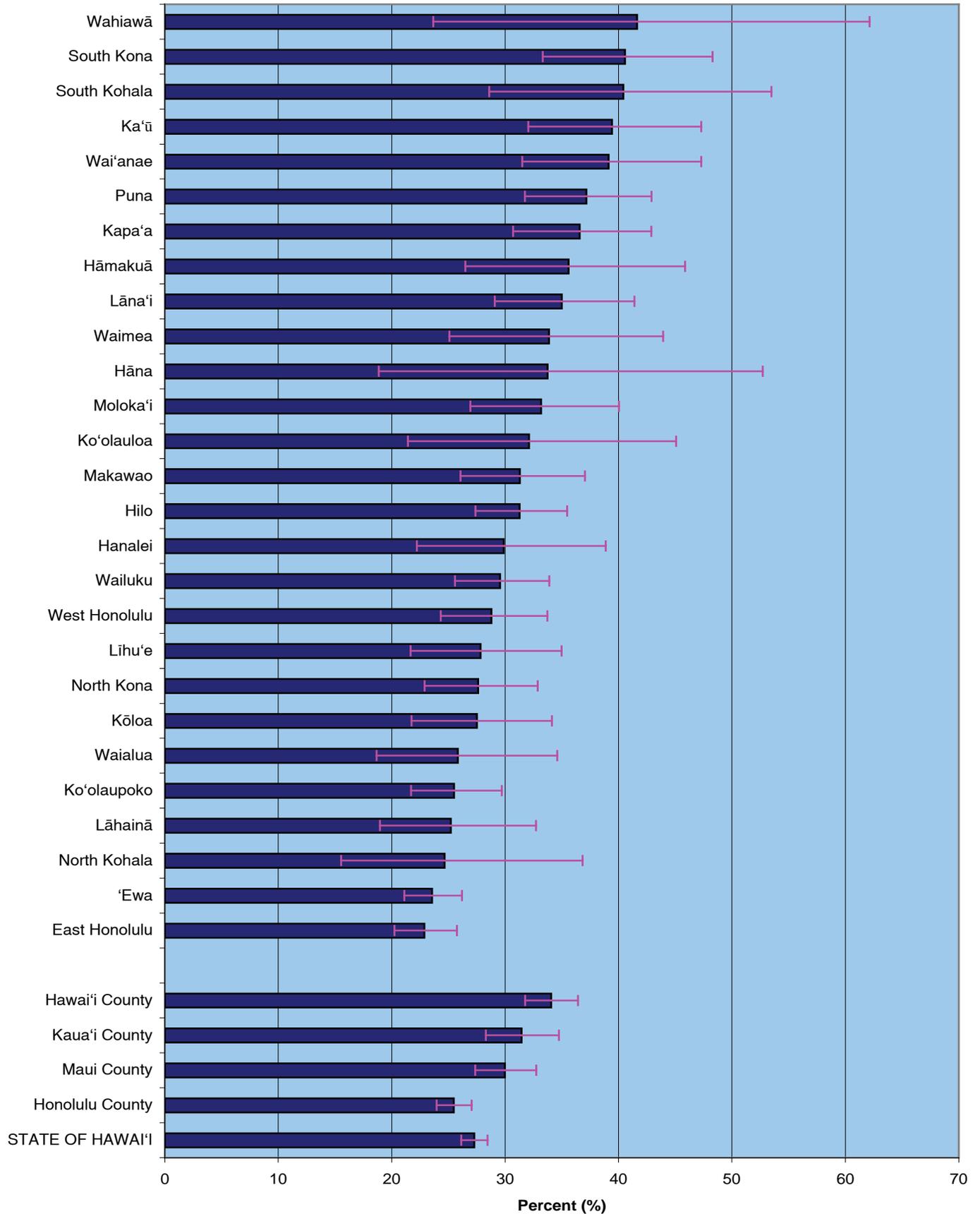
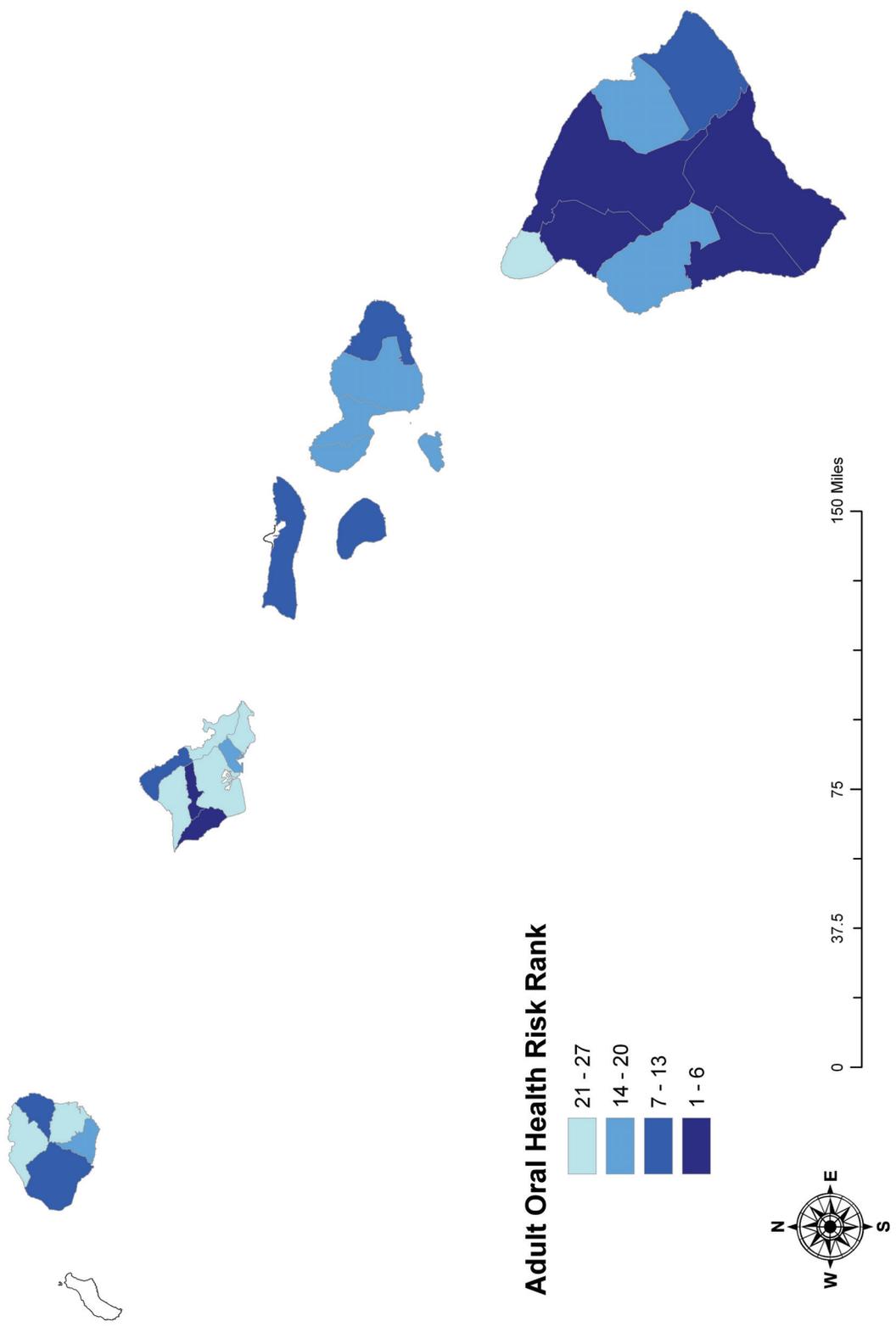


Table 32: Summary of Indicators for Adult Oral Health Risk Index, 2004, 2006, 2008

Service Area	Percent of Adults Who Did Not Visit a Dentist Within the Past Year (%)	Percent of Adults Who Ever Had Any Permanent Teeth Removed (%)	Percent of Adults Who Did Not Have Their Teeth Cleaned Within the Past Year (%)
State of Hawai'i	24.4	41.0	27.3
Honolulu County	23.0	40.0	25.5
East Honolulu	19.6	39.4	22.9
West Honolulu	28.6	42.6	28.8
'Ewa	20.8	38.8	23.6
Wahiawā	39.6	47.7	41.6
Wai'anae	39.0	47.2	39.1
Waialua	23.7	39.9	25.8
Ko'olauloa	31.1	48.9	32.1
Ko'olaupoko	22.1	38.2	25.5
Hawai'i County	28.8	45.3	34.1
Hilo	27.6	41.8	31.3
Puna	30.7	46.0	37.2
Ka'ū	33.7	46.8	39.4
South Kona	30.7	51.1	40.6
North Kona	23.0	43.0	27.6
South Kohala	35.8	42.8	40.4
North Kohala	16.6	46.3	24.7
Hāmakuā	32.7	54.5	35.6
Maui County	26.3	41.7	30.0
Hāna	25.9	49.3	33.7
Makawao	30.1	39.7	31.3
Wailuku	24.9	40.9	29.6
Lāhainā	21.0	46.7	25.2
Lāna'i	31.1	45.9	35.0
Moloka'i	29.2	40.9	33.2
Kaua'i County	29.3	38.7	31.4
Hanalei	26.9	34.9	29.9
Kapa'a	33.9	38.9	36.6
Līhu'e	25.5	36.9	27.8
Kōloa	26.4	40.0	27.5
Waimea	32.1	41.8	33.9

Table 33: Ranking Based on Adult Oral Health Risk Index

Ranking of Service Areas by County			State-Wide Ranking of Service Areas		
Service Area	Risk Rank	Risk Score	Service Area	Risk Rank	Risk Score
Honolulu County <i>(highest)</i>			State of Hawai'i <i>(highest)</i>		
Wahiawā	1	4.6	Wahiawā	1	4.6
Wai'anae	2	4.0	Wai'anae	2	4.0
Ko'olauloa	3	1.7	Hāmakuā	3	3.8
West Honolulu	4	-0.6	South Kona	4	3.6
Waialua	5	-2.6	Ka'ū	5	3.0
Ko'olaupoko	6	-3.3	South Kohala	6	2.7
'Ewa	7	-3.7	Puna	7	1.9
East Honolulu	8	-3.9	Ko'olauloa	8	1.7
	<i>(lowest)</i>		Lāna'i	9	1.6
Hawai'i County <i>(highest)</i>			Hāna	10	1.2
Hāmakuā	1	3.8	Kapa'a	11	0.9
South Kona	2	3.6	Waimea	12	0.7
Ka'ū	3	3.0	Moloka'i	13	-0.1
South Kohala	4	2.7	Hilo	14	-0.5
Puna	5	1.9	Makawao	15	-0.6
Hilo	6	-0.5	West Honolulu	16	-0.6
North Kona	7	-1.7	Wailuku	17	-1.5
North Kohala	8	-2.7	North Kona	18	-1.7
	<i>(lowest)</i>		Lāhainā	19	-1.7
Maui County <i>(highest)</i>			Kōloa	20	-1.8
Lāna'i	1	1.6	Hanalei	21	-2.4
Hāna	2	1.2	Līhu'e	22	-2.6
Moloka'i	3	-0.1	Waialua	23	-2.6
Makawao	4	-0.6	North Kohala	24	-2.7
Wailuku	5	-1.5	Ko'olaupoko	25	-3.3
Lāhainā	6	-1.7	'Ewa	26	-3.7
	<i>(lowest)</i>		East Honolulu	27	-3.9
Kaua'i County <i>(highest)</i>				<i>(lowest)</i>	
Kapa'a	1	0.9			
Waimea	2	0.7			
Kōloa	3	-1.8			
Hanalei	4	-2.4			
Līhu'e	5	-2.6			
	<i>(lowest)</i>				



Map 12: Adult Oral Health Risk Index by Primary Care Service Area



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<http://hawaii.gov/health/doc/pcna2009databook.pdf>

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