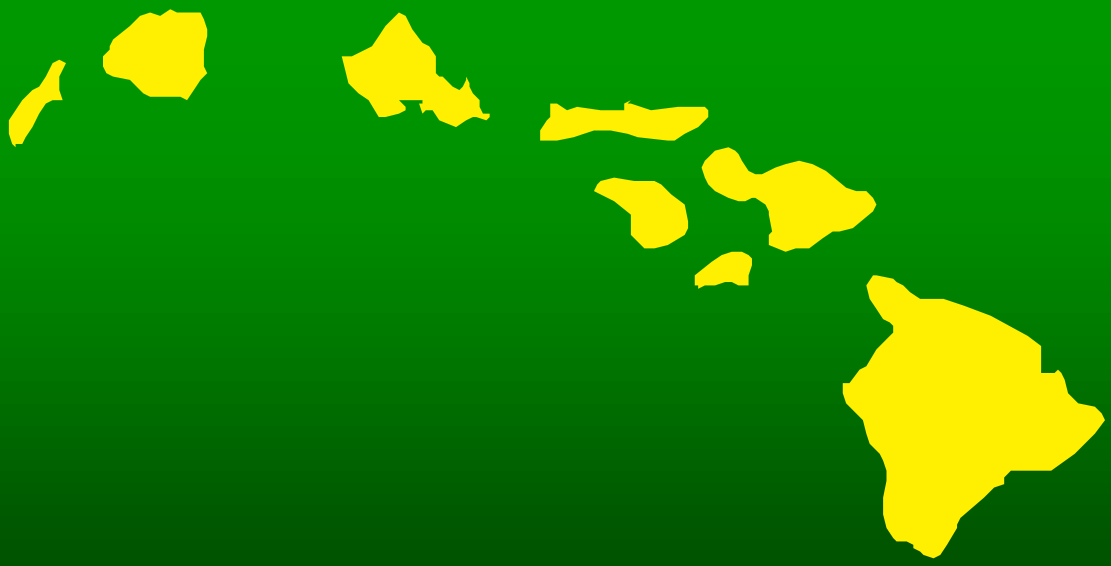
The Burden of Chronic Obstructive Pulmonary Disease (COPD) in Hawai‘i – 2010



A Message from the Director of Health

Aloha Kakou,

The Hawai'i State Department of Health is pleased to present the publication of the *Burden of Chronic Obstructive Pulmonary Disease (COPD) in Hawai'i – 2010*. The report, produced under the direction of the Department's Chronic Disease Management and Control Branch, compiles surveillance information and other data sources into a comprehensive document.

COPD is a complex disease that is a leading, cause of sickness, disability and death in the United States and in Hawai'i. Data from the 2008 Hawai'i Behavioral Risk Factor Surveillance System show that an estimated 3% to 4% of adults currently report COPD in Hawai'i. This equates to about 30,000 to 40,000 Hawai'i residents. International studies and data suggest that the actual number of people with undiagnosed COPD is equal to the number diagnosed; hence the true burden of COPD is underestimated.

Healthcare costs associated with COPD are very high. According to the Hawai'i Health Information Corporation (HHIC), total charges associated with hospitalizations due to a primary diagnosis of COPD amounted to more than 30 million dollars. This does not include healthcare costs associated with asthma-related outpatient and emergency department visits or prescription medications.

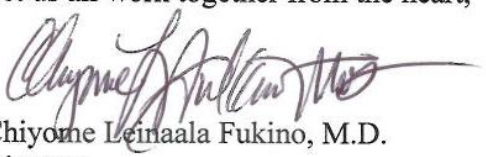
It is clear that the burden of COPD on Hawai'i's population is significant and will continue to rise as the population ages. The public health response to this increasing burden of COPD has several key components, surveillance being the first. Surveillance allows us to quantify the extent of COPD in the population, how severe it is, how well it is being controlled and how much it costs. Sound data will allow us to better direct resources when developing interventions to address COPD.

This report is a compilation of surveillance data specific to Hawai'i's population. This report is intended to provide decision makers, programs, agencies, organizations and anyone interested in COPD with timely and relevant information necessary for program planning and policy development.

COPD is a serious, complex and costly disease, but by working together, we can create a healthier Hawai'i. I invite you to join us in that effort.

Kuikahi kakou i ka puuwai,

Let us all work together from the heart,



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Acknowledgements

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Paul Enright, MD, a pulmonary specialist who works for the Centers for Disease Control and Prevention (CDC), reviewed the draft report and provided insight on the relationship between asthma and COPD. Robert Hirokawa, DrPH of the Department of Health’s Science and Research Group also reviewed the draft report. Valerie Chang of the COPD Coalition was instrumental in moving the reporting about the data on COPD forward. Thank you to Shu Liang and DungHanh Nguyen of the Hawai‘i BRFSS for their assistance with the data analysis. Thank you also to Alison Gano for assistance with the cover graphics.

Hospital and emergency department data were provided by the Hawai‘i Health Information Corporation

The biotherapeutics company Talecris Biotherapeutics generously donated funds through an educational grant in 2007 to add three COPD-specific questions to the Hawai‘i Health Survey. TPEP funds were used to pay for the addition of COPD-specific questions to the BRFSS in 2008 and 2009.

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HIGHLIGHTS of HAWAI'I'S CURRENT COPD BURDEN

Mortality:

- The mortality rate from chronic lower respiratory disease as an underlying cause of death is higher for Maui than other counties.
- The mortality rate for chronic lower respiratory disease as an underlying cause of death was highest for the county of Hawai'i.
- The mortality rate due to chronic lower respiratory disease as a non-underlying cause is higher among males than females. The mortality rate for chronic lower respiratory disease as a non-underlying cause has decreased slightly in recent years for both sexes, although rates are higher among males.

Overall Prevalence:

- Based on the 2008 BRFSS, it is estimated that 3.2% of respondents have COPD, which equates to an estimated 30,800 adults statewide.
- Based on the 2007 HHS, it is estimated that 2.2% of respondents have COPD, which equates to an estimated 22,000 adults statewide.

Basic Demographic Characteristics – Age and Ethnicity

- COPD increases with age, with those over age 65 reporting the highest prevalence. This finding was consistent across both BRFSS and HHS surveys, whereby the proportion of respondents over aged 65 with COPD was more than double the proportion of the 18-34 and 35-44 age groups combined.
- Whites had a significantly higher prevalence of COPD than other ethnic groups. Native Hawaiians and Chinese also had a higher prevalence of self-reported COPD, but these were not statistically significant.

Socioeconomic Characteristics – Employment, Household Income, Education

- Prevalence of COPD was highest among those unemployed or unable to work.
- According to the 2008 BRFSS, COPD prevalence was 2-3 times higher among those respondents who subsist on less than $15,000 per year than those in higher income levels. According to the HHS, COPD prevalence was 2-3 times higher for adults who subsist below the federal poverty level compared to those in middle and high income levels combined.
- Those adults with less than a high school education had a higher prevalence of self-reported COPD according to the HHS.

Prevalence by COPD Morbidities

- The additional chronic health conditions reported by those respondents with COPD on the HHS included asthma (10.5%), arthritis (4.6%), high blood pressure (3.0%) and diabetes (2.9%).
- Of those with COPD on the HHS, 60.9% reported being told they have bronchitis and almost 20% reported being told they have emphysema.
- Based on the BRFSS, it is estimated that 43.2% of adults with a diagnosis of COPD also reported being told they have asthma. Adults with COPD were more than four times as likely as adults with no COPD to report that they had heart attack or angina, heart disease or stroke (23.6% vs. 5.8%). 37.9% of adults who reported a diagnosis of COPD also reported presence of a chronic disease compared to adults without COPD (6.2%)

Obesity, Underweight and COPD

- Based on both the BRFSS and the HHS, adults with COPD were more likely to also be obese than those with no COPD. Adults with COPD were also more than twice as likely to be underweight than those without COPD on the BRFSS.

Smoking Prevalence

- Based on the BRFSS, among adults who reported COPD, it is estimated that more than one-fourth were current smokers (27.1%) whereas only 15.1% of adults without COPD reported being current smokers.
- Alternatively, close to a third of adults with COPD never smoked, which is half the rate for adults without COPD (29.4% vs. 60.2%).

Physical Disability and Physical Inactivity

- On the BRFSS, adults with COPD were more than twice as likely to report being disabled (with activity limitation or use special equipment) compared to those without COPD (47.5% vs. 17.6%).
- Adults who reported COPD were more likely to also report no physical activity (27.3% vs. 18.6%) compared to those without COPD.
- According to the HHS, adults with COPD were several times more likely to also report upper and lower body mobility limitations compared to those who did not report COPD (Upper Body: 44.2% vs. 14.5%; Lower Body: 52.6% vs. 14.4%).

Access to Care

- According to the BRFSS, the prevalence of no health care coverage was higher among with no COPD than among adults with COPD (6.4% vs. 4.2%).
- About 10% of adults with COPD vs. 6.8% of adults with no COPD reported that in the past 12 months there was a time they needed to see a doctor, but could not due to cost.

Health Status and Health Related Quality of Life

- According to the BRFSS, the proportion of those with COPD who reported fair or poor health was three times higher than those with no reported COPD (42.9% vs. 13.7%). Conversely, those with COPD were less likely to report good or excellent health than those with no reported COPD (57.1% vs. 86.3%).
- On the BRFSS, those adults with COPD were more likely to report lack of social support, dissatisfaction with life and frequent mental and physical distress compared to those without COPD.

Hospital Discharges & Emergency Department Visits

- Data from the HHIC show that in 2008 there were 1,595 hospitalizations specifically for COPD.
- The total charges for COPD hospital discharges were over $30 million in 2008. Two-thirds (63.8%) of the hospital charges were paid for by Medicare, with 16% paid for by private insurance, and 12.2% by Medicaid/QUEST.
- In 2008 there were 1,294 emergency department (ED) visits for COPD and another 1,134 admitted to the hospital via the emergency department. Almost one-half (46.7%) of COPD ED visits ended up being admitted to the hospital.
- Charges for ED visits for COPD were almost $3 million ($2,998,459), with an additional $22.9 million in charges for those who were admitted to the hospital from the ED.
- Similar to hospital discharges, most of the emergency department discharges were paid for by Medicare (63.6%), with 15.2% paid for by private insurance and 13.7% by Medicaid/QUEST.

INTRODUCTION

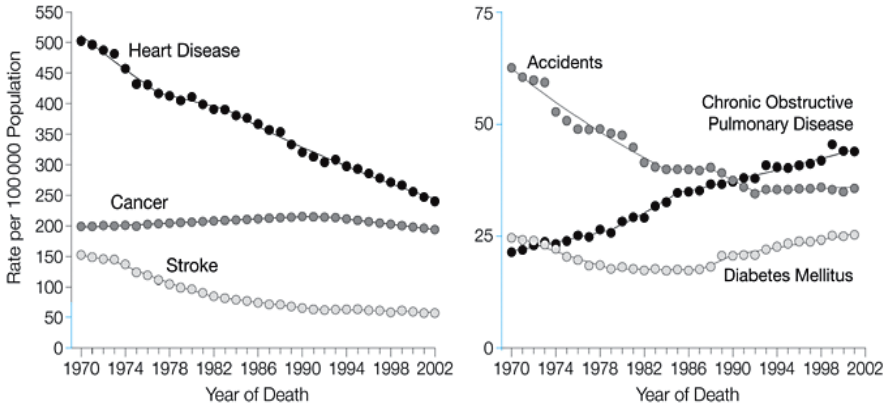
Global and National Data

Chronic obstructive pulmonary disease (COPD) includes a diverse group of progressive diseases characterized by airflow obstruction that impairs normal breathing and can include chronic bronchitis, emphysema, and in some cases asthma (Centers for Disease Control and Prevention, 2008). COPD can result in gradual loss of lung function and is not fully reversible (Halpern et al, 2003).

COPD is a leading but under-recognized cause of morbidity and mortality nationally and globally (Pauwels & Rabe, 2004; Buist et al, 2007), with 14 million Americans estimated to have undiagnosed COPD (Tinkelman & Corsello, 2003). Globally, COPD is responsible for 7% of the world's deaths and 4% of the world's global burden of disease as measured in disability-adjusted life years (DALYs) (Beaglehole et al, 2005).

In the United States, COPD is a leading cause of death, illness, and disability in the United States (Beers, 2007, CDC, 2009). COPD is projected to be the third leading cause of death for both sexes by the year 2020 (National Heart, Lung, and Blood Institute, 2003). As depicted in the Figure 1 below, of the six leading causes of death in the United States, only COPD has been steadily increasing (Jemal et al, 2005).

Figure 1. Trends in Age-Standardized Death Rates for the Six Leading Causes of Death in the United States, 1970-2002.[1] Rates are age-adjusted to the 2000 US standard population.



Source: Jemal, Ward, Hao, and Thun, 2005

[1] The method of coding causes of death from 1970 to 2002 changed twice – from ICD 8 to ICD 9 to ICD 10. Because of the change in the method of coding, there may be comparability problems during this period.

Estimates of the true prevalence of COPD diagnosis vary depending upon how COPD is defined. According to the American Thoracic Society definition of COPD (i.e. airway obstruction and chronic bronchitis or emphysema), an estimated national prevalence of 4.8 million adults (2.9% of the U.S. adult population (American Thoracic Society/European Respiratory Society Task Force, 2004), while the Global Initiative for Chronic Obstructive Lung Disease (GOLD) definition (i.e. presence of airway obstruction only) resulted in much higher prevalence estimates of 23.6 million adults (13.9% of the U.S. adult population) (Mannino, 2002).

It is estimated that 75-80% of COPD cases are caused by smoking (Mannino et al, 2002; Centers for Disease Control and Prevention, 2008), although some occupational exposures to dusts and, or chemicals have been documented. The role of outdoor air pollution in COPD is uncertain. Globally, COPD can be caused by repeated exposure to indoor air pollution from cooking fumes from biomass fuels (Sundeep & Barnes, 2009). The number of affected individuals and the number of deaths from COPD are both expected to increase as the population ages (Mannino & Buist, 2007).

Although smoking is the most studied risk factor for COPD, it is not the only one and evidence suggests that nonsmokers may develop COPD as well (Behrendt, 2005). Research also suggests a genetic susceptibility to COPD (COPDGene® Study, 2009). Therefore, it is important to understand the multifactor risks associated with acquiring COPD. Table 1 lists the various risk factors.

Table 1: Risk Factors for Chronic Obstructive Pulmonary Disease (COPD)

Genetic Factors Inhalation Exposures ▪ Tobacco Smoke ▪ Occupational Dusts, Chemicals, Vapors, Fumes ▪ Indoor Air Pollutants ▪ Outdoor Air Pollutants Aging History of Infections (Especially Respiratory Infections) Asthma Sex Socioeconomic Factors (Poverty, Nutrition, Access to Health Care) Co-morbidities
Source: Mannino & Buist, 2007; Global Initiative on Chronic Obstructive Lung Disease (GOLD), 2009

Every COPD patient in the United States constitutes nearly $6,000 annually in excess health care costs (Miller et al, 2005), and the estimated cost of COPD in the U.S. in 2002 was $32.1 billion (National Heart Lung and Blood Institute, 2003). In a sample of 8,370 Medicare enrollees, people with COPD were more likely to utilize healthcare services and had excess total healthcare costs $20,500 higher (P<0.0001) than a comparison cohort, and 46% of these excess costs were due to comorbidities (cardiovascular disease, stroke, cancer) (Menzin et al, 2008). In a large scale international survey of COPD burden, the annual cost of healthcare resource utilization was estimated at $4,119 per patient, with indirect (non medical-care) costs of $1,527 per patient, and each COPD patient costs society an estimated $5,646 (Halpern et al, 2003). However, this does not include costs associated with premature disability, since COPD is the second leading cause of disability in the United States. In the U.S., about 1.5 million emergency department visits by adults 25 and older were made for COPD in 2000, along with 726,000 hospitalizations (National Heart Lung and Blood Institute, 2003).

COPD in Hawai‘i

Due to a lack of information about COPD in Hawai‘i, in 2007, the Hawai‘i COPD Coalition, a 501(c)3 non-profit Hawai‘i corporation, was formed to better address COPD issues. The Hawai‘i COPD Coalition teamed up with the Hawai‘i State Department of Health (DOH) to assist in gathering relevant data on COPD in Hawai‘i and initially paid for the COPD survey questions on the Hawai‘i Health Survey (HHS) in 2007. Additional monies for COPD questions on the Behavioral Risk Factor Surveillance Survey (BRFSS) in 2008 and 2009 were paid for by the Tobacco Prevention and Education Program (TPEP) at the DOH.

This report provides pertinent and current information on the prevalence of Chronic Obstructive Pulmonary Disease (COPD) in Hawai‘i, along with COPD mortality, related conditions (e.g. emphysema, bronchitis and asthma) and co-morbid chronic conditions (e.g. arthritis, diabetes, high blood pressure, high blood cholesterol). Additional information on COPD preventive care practices, health status and health related quality of life, access to healthcare, risk factors and disability are also examined.

The aim of this document is straightforward: to provide insight on the burden and distribution of COPD among Hawai‘i’s residents, thereby allowing local communities to focus resources and attention to where it is most needed.

Quantifying the burden of COPD in this report is based on prevalence, mortality, morbidity and hospital and emergency department discharges. Data sources are described in the next section.

DATA SOURCES

Data for this report on COPD burden were obtained from three main sources in the DOH: (1) death certificates where chronic lower respiratory disease (including COPD) is listed as an underlying or non-underlying cause of death (Office of Health Status Monitoring), (2) state-added survey questions on self-reported, doctor diagnosed COPD on the telephone-based Behavioral Risk Factor Surveillance System Survey, and (3) questions to an adult respondent (aged 18 years and older) on self-reported doctor/medical professional diagnosed COPD on the telephone-based Hawai‘i Health Survey (Office of Health Status Monitoring). In addition, hospital discharge and emergency room data obtained from the Hawai‘i Health Information Corporation (HHIC) was used in this report. Following is a summary of all data sources as well as their corresponding focus area within this COPD burden report.

Vital Records

The management of birth certificates, marriage licenses, and death certificates is handled by the Office of Health Status Monitoring (OHSM) within the DOH. This office collects, processes, analyzes and disseminates relevant, population-based data in order to assess the health status of Hawai‘i’s population and to fulfill health statistics legal requirements. OHSM also provides vital statistics and demographic and health data for use in identifying state and community health trends, identifying population groups at risk for serious health problems, and evaluating program effectiveness. OHSM provides a repository for vital event records within the state such as births, deaths, and marriages and provides copies to the general public. In the last two years an electronic death certificate system has been

implemented for a more streamlined and efficient process. For more information: http://hawaii.gov/health/statistics/vital-statistics/index.html.

Behavioral Risk Factor Surveillance System (BRFSS)

The BRFSS is the largest continuously conducted telephone health survey in the world. The annual telephone survey of non-institutionalized adults (>18 years) has been conducted in all states and territories in the United States since 1988. The BRFSS, based on self-reports, assesses risk factors for disease(s) and conditions related to the ten leading causes of death in the U.S. population. Data collected through the BRFSS is routinely used to capture health information on demographically defined subgroups (gender, ethnicity, age, educational level, income level, geographic location). The BRFSS enables the Centers for Disease Control and Prevention (CDC), state health departments, and other health and education agencies to monitor risk behaviors related to chronic diseases, injuries and death.

The Department of Health (DOH) has been an active participant in the BRFSS since 1986. The Hawai‘i BRFSS is a collaboration between the DOH and the CDC. The Hawai‘i BRFSS follows all the protocols and guidelines of the CDC. The survey uses a complex random sample design. The adult participant is selected randomly when the number of adults in the randomly sampled telephoned household is more than one. For more information, refer to the appendix/glossary and the survey website: http://hawaii.gov/health/statistics/brfss/index.html.

Hawai‘i Health Survey (HHS)

The Hawai‘i Health Survey (HHS), Department of Health, Office of Health Status Monitoring (OHSM) is one of only a few state surveys that provides population-based estimates of the health and demographics of their population. The HHS was first conducted in 1968 as an “in person” household survey modeled after the National Health Interview Survey. Starting in 1996 the survey information was collected using computer assisted telephone interviewing (CATI). The core of HHS provides information for demographic, socio-economic and specific health characteristics, e.g. island, ZIP code, gender, age,

income, ethnicity, education, household size, insurance status, general physical and mental health status and selected chronic conditions including asthma. Calculated variables are created from detailed questions pertaining to the specific topic (e.g. insurance status is coded from 17 possible questions).

The HHS differs from the BRFSS in that a knowledgeable adult member (respondent aged 18 years or older) of the household is asked questions relating to the household and each household member. Thus, data can be reported for the household, population, children and, or adult population. Sample size for respondents is approximately 6,000 per year with a total of 15,000 household members including children. Data are weighted to estimate the households, adult population, or total population of Hawai‘i. In addition, data are adjusted as households without telephones, group quarters, homeless and the island of Niihau are not sampled.[2] For this burden report, only information on the respondent is reported and thus represents the adult population of Hawai‘i. For more information, refer to the appendix, glossary and the survey website: http://hawaii.gov/health/statistics/hhs/index.html.

Hawai‘i Health Information Corporation (HHIC)

The HHIC is a private, not-for-profit corporation established in 1994. It maintains one of Hawai‘i’s largest healthcare databases, which contains nearly one million inpatient discharge records collected from Hawai‘i’s 22 acute care hospitals for each year since 1993. These discharge records contain patient demographic information, hospital visit costs and duration, and patient diagnosis using the International Classification of Diseases (ICD), Version 9 (ICD-9) codes and by Diagnostic Related Codes (APR-DRG). Data from the HHIC in this report are obtained from the HHIC APR-DRG codes for COPD (but not the ICD-9 codes) and this provides some additional estimates about the burden of COPD in Hawai‘i. The DOH has a subscription to view aggregated and de-identified patient data, and has obtained permission to present the data in this report. For more information, refer to: http://hhic.org/.

[2] *Hawai‘i Health Survey 2007, Procedure Manual. 2007*. SMS Research & Marketing Services, Ind. and Hawai‘i Department of Health, Office of Health Status Monitoring.

MORTALITY

Chronic Lower Respiratory Disease Mortality - Vital Statistics

COPD mortality data are obtained from death certificates and vital statistics compiled from the Office of Health Status Monitoring within the DOH. Mortality for chronic lower respiratory diseases (including COPD) as either an underlying or non-underlying cause of death has remained fairly steady for the past seven years.

COPD mortality data are graphically presented in the figures below. These data represent all resident deaths from chronic lower respiratory diseases combined[3] for the years 2001 to 2007. All data are age-adjusted based on the year 2000 US standard population and are differentiated by being either the underlying cause of death or non-underlying cause of death. The death rates for Kauaʻi were not presented since they do not meet standards of reliability and precision, except for the year 2006 when the death rate was 37 per 100,000. Age-adjusted rates by ethnicity were not calculated because the ethnic-specific population denominators were unstable.

The death rate for chronic lower respiratory diseases by county as both an underlying and non-underlying cause of death (Figures 4 and 5) was stable from 2001-2007 for Oʻahu and for the state overall; rates seem to fluctuate more for Maui and the Big Island, but overall show no clear upward or downward trend. There are recent increases from 2006 to 2007 for Maui and Hawaiʻi for chronic lower respiratory diseases as both an underlying and non-underlying cause of death. The death rate for chronic lower respiratory diseases as an underlying cause of death by sex shows higher death rates for males for 2001-2007, and rates seem to be decreasing. The death rates for chronic lower respiratory diseases as a non-underlying cause of death, rates seem stable for females but are decreasing for males.

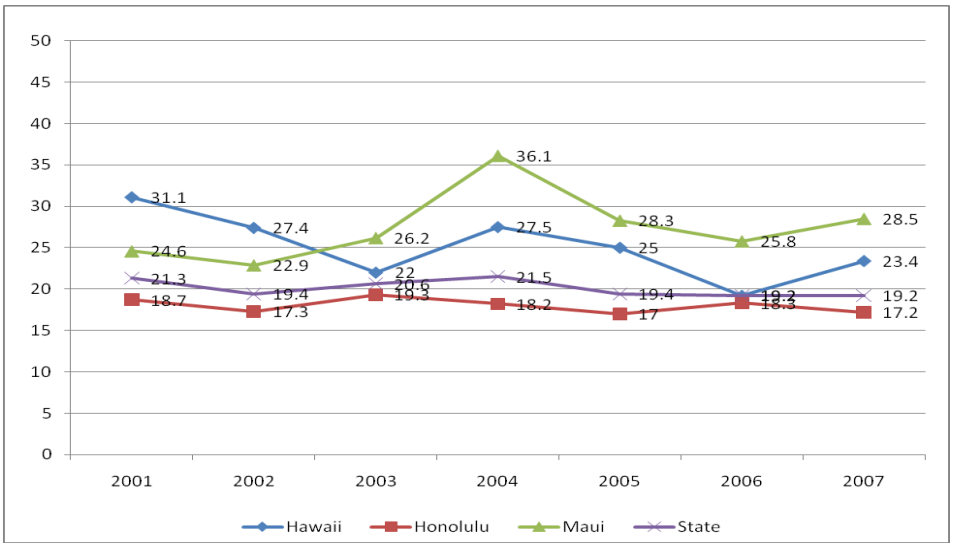
This initial examination of mortality for chronic lower respiratory diseases provides a picture of the current situation for the state of Hawaiʻi. No trend is apparent at this time.

[3] This includes the International Classification of Diseases, Version 10 (ICD 10) codes J40-47 which includes bronchitis (J40), chronic bronchitis (J41), unspecified bronchitis (J42), emphysema (J43), asthma (J45/46) and other chronic obstructive pulmonary disease (J47).

Hawai‘i’s mortality rate for chronic lower respiratory diseases is much lower than the majority of other states for COPD (Centers for Disease Control and Prevention, 2004; 2008), and this may correspond to lower smoking rates in Hawai‘i compared to the U.S.

Figure 2. Trends in Resident Deaths by County, 2001-2007, With Chronic Lower Respiratory Disease as an Underlying Cause of Death per 100,000[4]

- Maui County’s mortality rate from chronic lower respiratory disease as an underlying cause has been higher than Hawai‘i and Honolulu County and the State average since 2003.



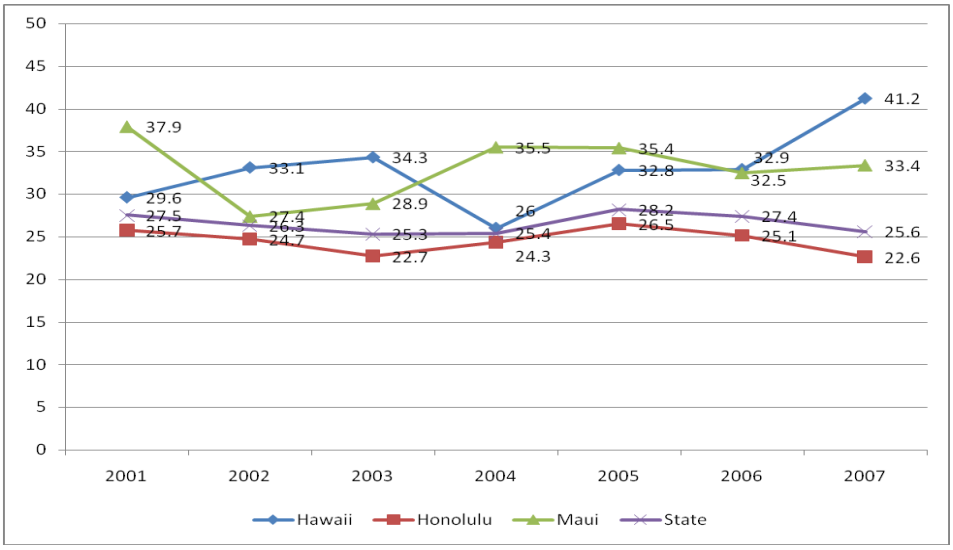
SOURCE: DOH - Office of Health Status Monitoring

When comparing Figure 2 to Figures 8 and 9 below, the counties (Maui, Hawai‘i) with the highest mortality rates due to Chronic Lower Respiratory Disease are also those counties with the highest COPD prevalence according to BRFSS and HHS.

[4] Age adjusted death rates were calculated by county of residence and gender. Age adjusted rates by ethnicity were not calculated due to unstable denominators.

Figure 3. Trends in Resident Deaths by County, 2001-2007, With Chronic Lower Respiratory Disease as a Non-Underlying Cause of Death per 100,000

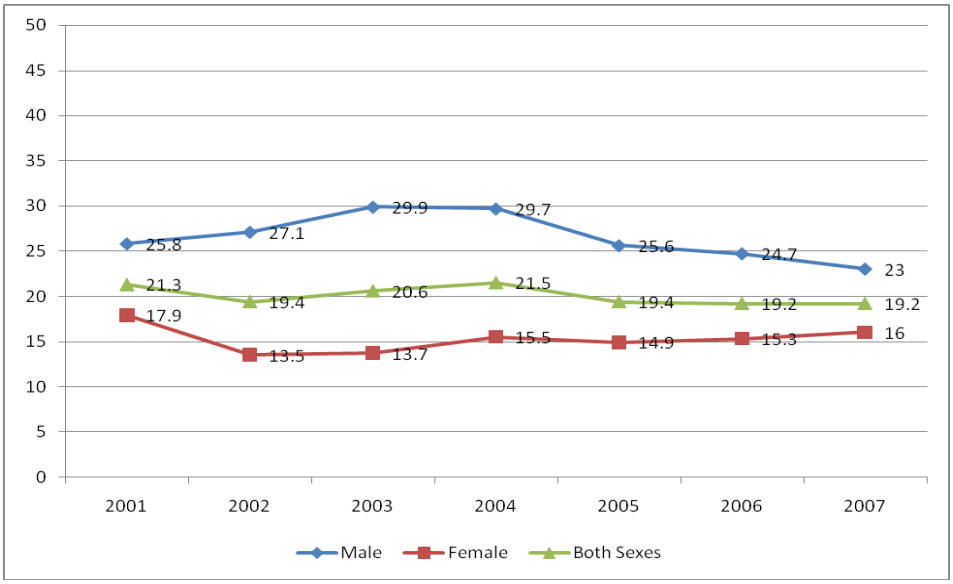
- Hawai‘i County’s rate increased from 32.9% to 41.2% over a one year period (2006 to 2007).



SOURCE: DOH - Office of Health Status Monitoring

Figure 4. Trends in Resident Deaths by Sex, 2001-2007, With Chronic Lower Respiratory Disease as an Underlying Cause of Death per 100,000

- The mortality rate due to chronic lower respiratory disease as an underlying cause has steadily increased for females since 2002.
- The mortality rate due to chronic lower respiratory disease as an underlying cause has decreased steadily for males since 2004, but consistently remains higher than females.
- The disparity between males and females decreased between 2003 and 2007.



SOURCE: DOH - Office of Health Status Monitoring

These results are congruent with data presented in Figures 8 and 9 below, as well as the national mortality rates for COPD. In the U.S., the mortality rate for women rose from 20.1 deaths per 100,000 to 56.7 deaths per 100,000 from 1980 to 2000 (Centers for Disease Control and Prevention, 2009).

Figure 5. Trends in Resident Deaths by Sex, 2001-2007, With Chronic Lower Respiratory Disease as a Non-Underlying Cause of Death per 100,000

- The mortality rate for chronic lower respiratory disease as a non-underlying cause has decreased in recent years for both sexes.

SOURCE: DOH - Office of Health Status Monitoring

PREVALENCE ESTIMATES: TWO HEALTH SURVEYS

The Behavioral Risk Factor Surveillance System (BRFSS) and the Hawai‘i’s Health Survey (HHS), both provide estimates of COPD prevalence across multiple variables. However, these two surveys have different methods for data collection so findings of one survey are not necessarily more valid than the other. Examining data from both surveys provides better comprehensive understanding of the burden of COPD in our state and allows for cross-validation of findings.

Behavioral Risk Factor Surveillance System (BRFSS)

The case definition of COPD on the national BRFSS is based on responding “yes” to the question: “Have you ever been told by a doctor or another health professional that you have chronic obstructive pulmonary disease, also called COPD, emphysema or chronic bronchitis?” In 2008, it was estimated that 3.2% of Hawai‘i adults have COPD based on yes responses to this question on COPD. This translates to approximately 30,800 adults in the state of Hawai‘i.

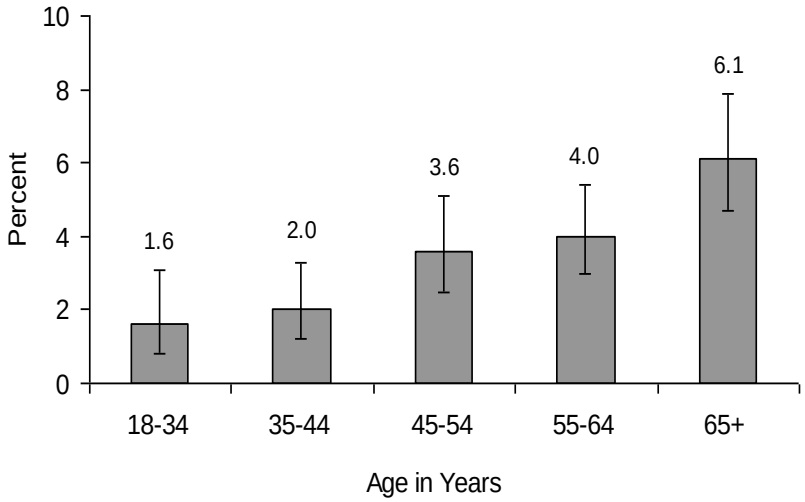
Hawai‘i Health Survey (HHS)

To determine household members with COPD, the adult respondent is asked: “Has anyone in the household ever been told by a physician or medical professional that they have chronic obstructive pulmonary disease, also called COPD, emphysema or chronic bronchitis?” and “What are the names (initials) of those household members?” Answers to the question for each household member were categorized as “yes,” “no,” “don’t know,” or “refused to answer.” The present report includes weighted respondent answers, rather than each household member. According to HHS data for 2007, an estimated 2.2% of Hawai‘i adults have ever been told they have COPD, which translates to an estimated 21,559 adults in Hawai‘i’s population with COPD.

PREVALENCE ESTIMATES BY SOCIAL, DEMOGRAPHIC, AND ECONOMIC CHARACTERISTICS

Figure 6. Adult COPD Prevalence by Age, BRFSS, Hawai‘i 2008

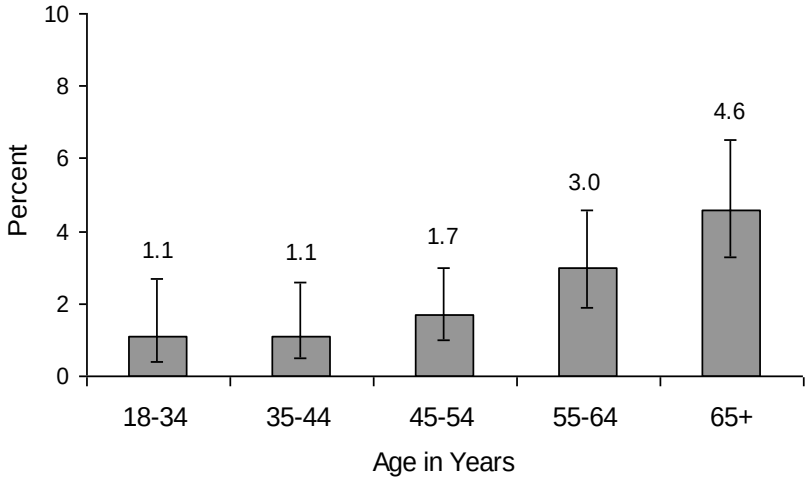
- Self-reported COPD prevalence increases with age, with those over age 65 reporting the highest prevalence.
- 6.1% of adults age 65 and older age reported they had COPD, which is twice the proportion of the 18-34 and 35-44 age groups combined.



SOURCE: Hawai‘i BRFSS - Hawai‘i State Department of Health

Figure 7. Adult COPD Prevalence by Age, HHS, Hawai‘i 2007

- ❖ Self-reported COPD prevalence increases with age, with those over age 65 reporting the highest prevalence (4.6%).
- ❖ 4.6% of adults age 65 and older reported they had COPD, which is more than double the 18-44 age groups combined.



SOURCE: HHS - Hawai‘i State Department of Health

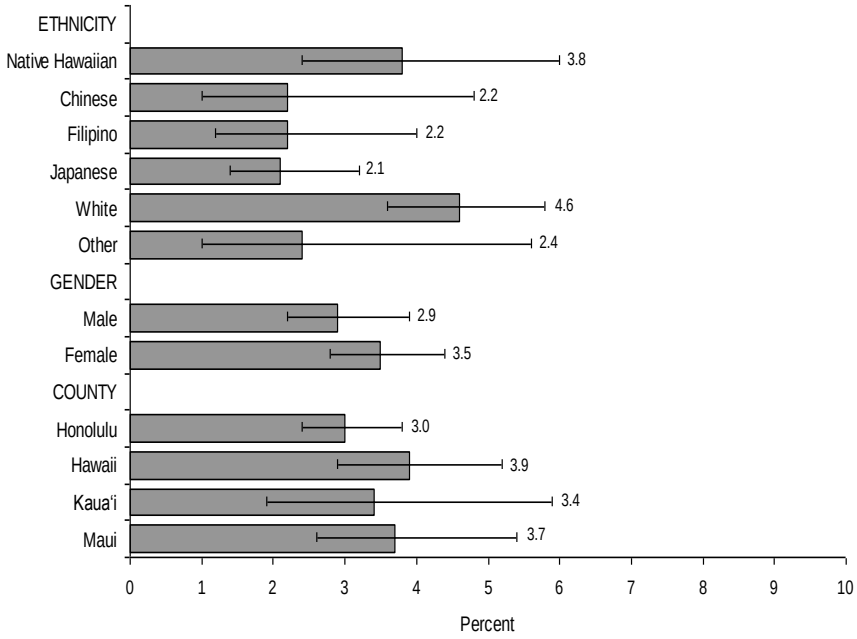
As depicted in Figure 7, COPD prevalence increases with age and is higher for those respondents aged 65 for both the BRFSS and the HHS. However, prevalence estimates for adult are slightly higher for BRFSS respondents (3.2%) than HHS respondents (2.2%).

On the HHS, odds ratios[5] for COPD substantiate higher prevalence in the older age groups. Those respondents aged 45-54 are 14.96 times more likely, those aged 55-64 are 19.58 times more likely, and those who are 65 and older are 29.02 times more likely to report COPD than those 18-34 years old (significant at alpha = 0.05). Refer to tabular data in Appendix C for more information.

[5] Odds ratio = measure of effect size, describing the strength of association or non-independence between two binary data values. The odds ratio treats the two variables being compared symmetrically, and can be estimated using some types of non-random samples.

Figure 8. Adult COPD Prevalence by Selected Demographic Characteristics, BRFSS, Hawai‘i 2008

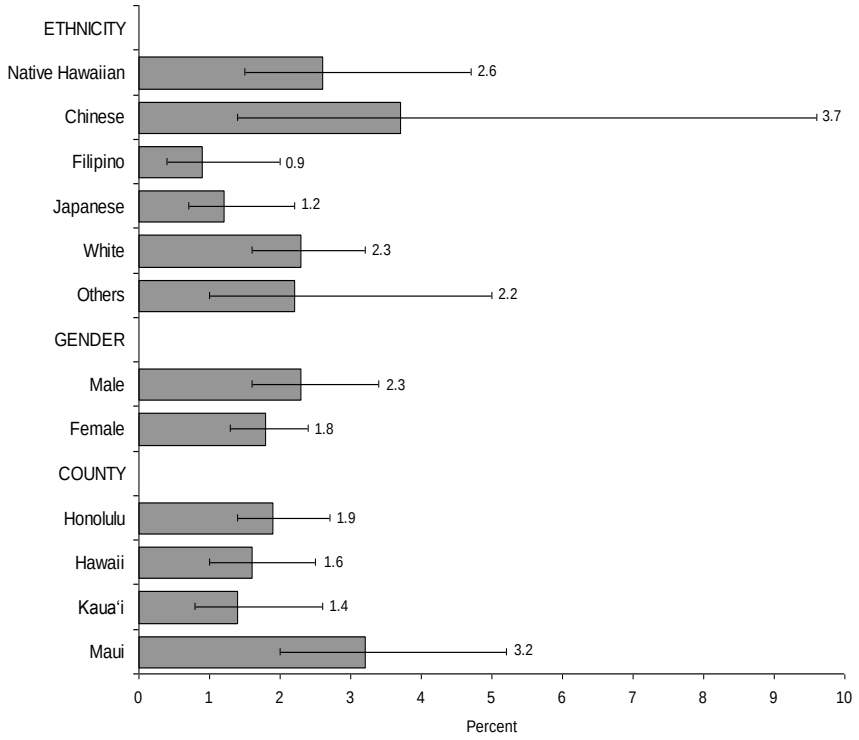
- On the BRFSS, Whites had a significantly higher prevalence of self-reported COPD when compared with the other major ethnic groups. Native Hawaiians also had higher self-reported COPD prevalence (non-significant).
- Females had a higher (non-significant) prevalence of self-reported COPD than males. The higher prevalence of COPD among women is consistent with national data.
- Hawai‘i County experienced higher prevalence of self-reported COPD than the other counties (non-significant).



SOURCE: Hawai‘i BRFSS - Hawai‘i State Department of Health

Figure 9. Adult COPD Prevalence by Selected Demographic Characteristics, HHS, Hawai‘i 2007*

- On the HHS, Chinese and Native Hawaiians had a higher prevalence (non-significant) of self-reported COPD when compared with the other major ethnic groups. However, the sample size for Chinese is small, thus the respective confidence interval is wide and should be interpreted with caution.
- Males had a slightly higher (non-significant) prevalence of self-reported COPD than females.
- Maui County experienced higher prevalence of self-reported COPD than the other counties (non-significant).

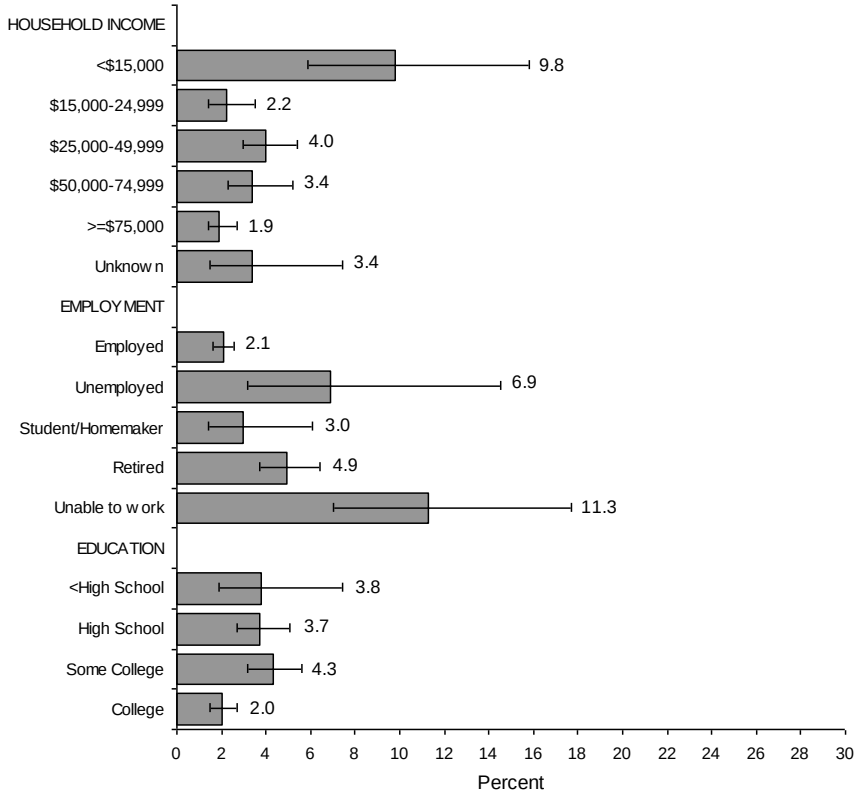


* Age Adjusted to 2000 Census

SOURCE: HHS - Hawai‘i State Department of Health

Figure 10. Adult COPD Prevalence by Socioeconomic Status, BRFSS, Hawai‘i 2008

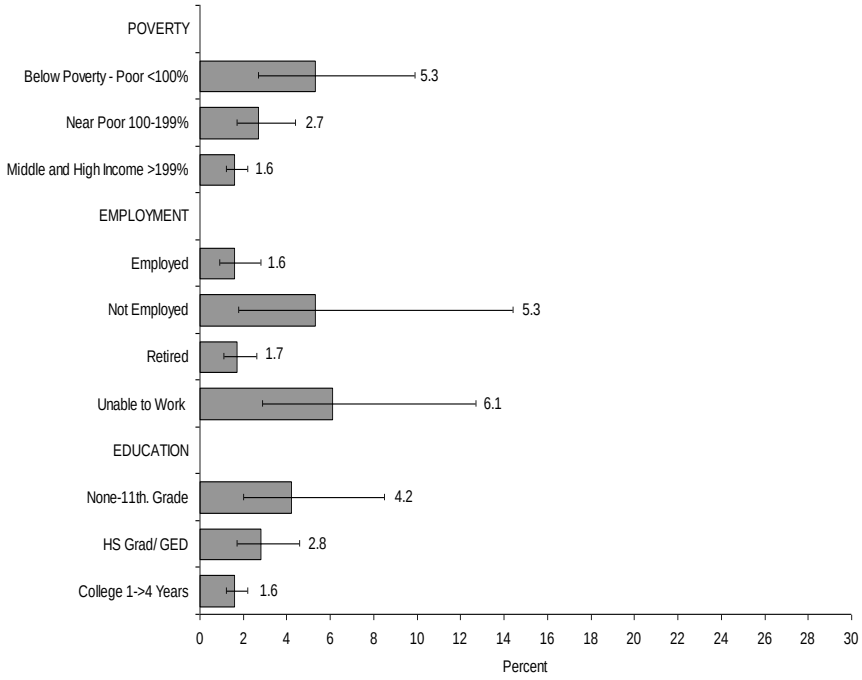
- On the BRFSS, prevalence of COPD was highest among those who report being unable to work (11.3%).
- COPD prevalence was 2-3 times higher among those with household incomes less than $15,000 per year than those with higher incomes.
- COPD prevalence was lower (non-significant) among adults who reported having at least 4 years of college education compared with those with less than a college education.



SOURCE: Hawai‘i BRFSS - Hawai‘i State Department of Health

Figure 11. Adult COPD Prevalence by Socioeconomic Status, HHS, Hawai‘i 2007*

- On the HHS, prevalence of COPD was highest among those who report being unable to work (6.1%).
- COPD prevalence was 2-3 times higher for adults who subsist below the federal poverty level compared to those in the middle and high income group.
- Those adults who reported obtaining a college education had a significantly lower prevalence of self-reported COPD ($p<0.05$) compared with those with less than a high school diploma or GED.



* Age Adjusted to 2000 Census

SOURCE: HHS - Hawai‘i State Department of Health

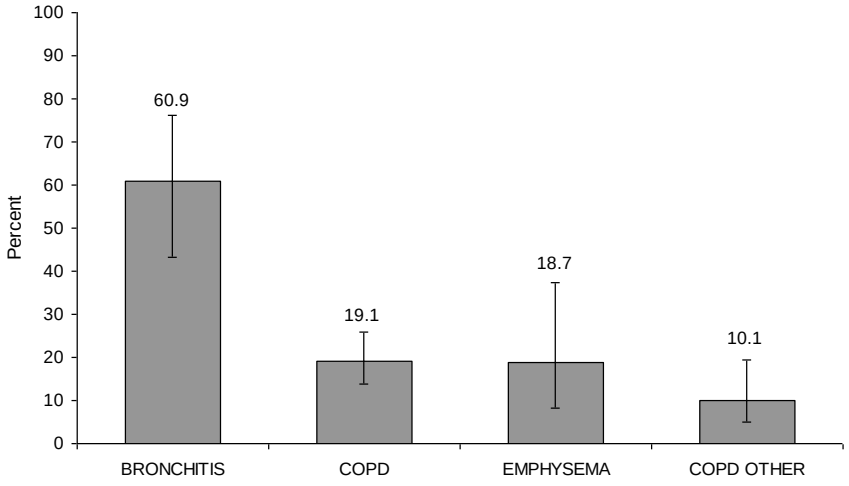
For adults who report living below the poverty level, the odds of having COPD are 2.4 times greater than the odds for adults living at middle and high income combined (>199% federal poverty level). This is based on odds ratios adjusted for age, gender, marital status, and education calculated from the HHS. Refer to tabular data in Appendix C for more information.

PREVALENCE ESTIMATES BY COPD MORBIDITIES

COPD includes emphysema and chronic bronchitis, even though there is considerable confusion about this among patients and healthcare providers. COPD also overlaps with asthma, sharing many symptoms and risk factors; some doctors and other healthcare professionals diagnose patients who have asthma as having COPD and diagnose patients who have COPD as having asthma. COPD tends to develop over time gradually with patients noticing increasing difficulty with daily activities. COPD is difficult to diagnose and more likely to be under-reported. For every person diagnosed with COPD, there is another who may remain undiagnosed (Chapman et al, 2006).

Figure 12. Prevalence of Specific Respiratory Condition Among those who Reported Chronic Obstructive Pulmonary Disease (Chronic Bronchitis, Emphysema, COPD), HHS, Hawai‘i 2007*[6]

- Of those who reported Chronic Obstructive Pulmonary Disease (n = 21,559), 60.9% reported being told they have bronchitis and almost 20% reported being told they have emphysema.



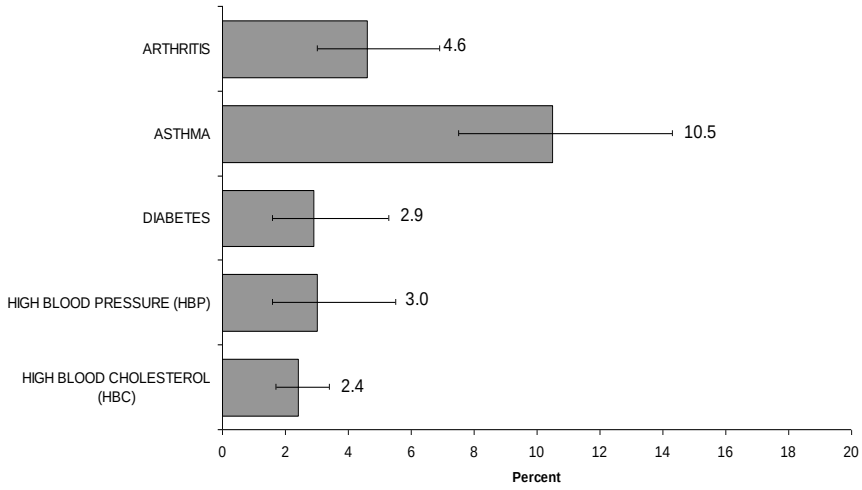
*Age Adjusted to Census 2000

SOURCE: HHS - Hawai‘i State Department of Health

[6] The HHS question “What conditions have you been told you have?” is asked only of those who report COPD and they can respond to the question with more than one condition. For this reason, the total percentage in Figure 12 is greater than 100%.

Figure 13. Adult COPD Prevalence by Selected Chronic Health Conditions, HHS, Hawai‘i 2007*

- COPD prevalence was highest for adults with asthma (10.5%), arthritis (4.6%), high blood pressure (3.0%), and diabetes (2.9%).



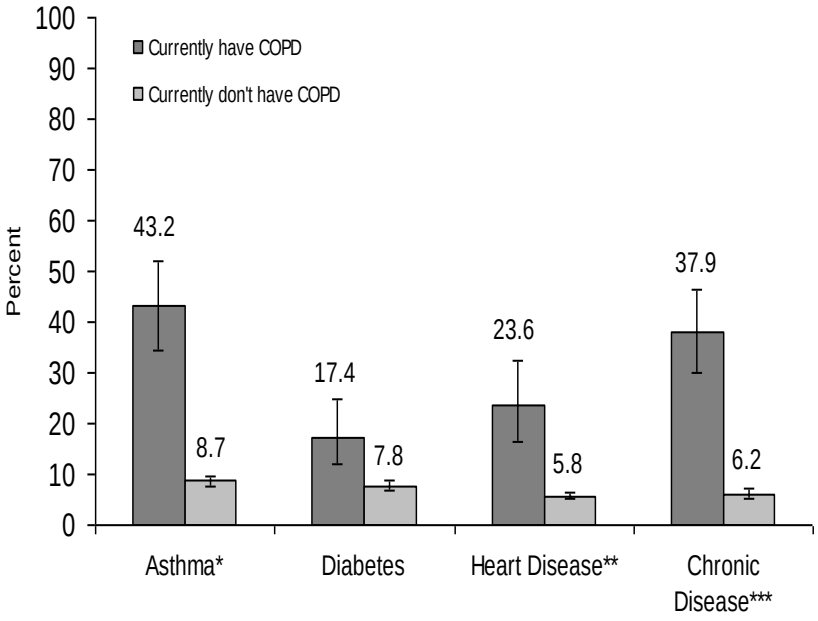
* Age Adjusted Census 2000

SOURCE: HHS - Hawai‘i State Department of Health

After adjusting for age, gender, marital status, and poverty level, respondents who reported COPD were still 10.47 times more likely to also report asthma and 1.91 times more likely to also report high blood cholesterol (HBC) ($p<0.05$). This is based on multiple logistic regression analysis using the HHS data.

Figure 14. Prevalence of Selected Chronic Health Conditions by COPD Status, BRFSS, Hawai‘i 2008

- 43.2%* of adults who reported a diagnosis of COPD also reported asthma[7] compared to only 8.7% of adults without COPD.
- Adults who reported COPD were more than four times as likely as adults with no COPD to report that they had heart attack or angina, heart disease or stroke (23.6% vs. 5.8%).
- 37.9% of adults who reported a diagnosis of COPD also reported presence of a chronic disease compared to adults without COPD (6.2%)



* Includes those who report “current asthma”
** Had heart attack or angina heart disease, or stroke
***Have been told that you have a chronic illness

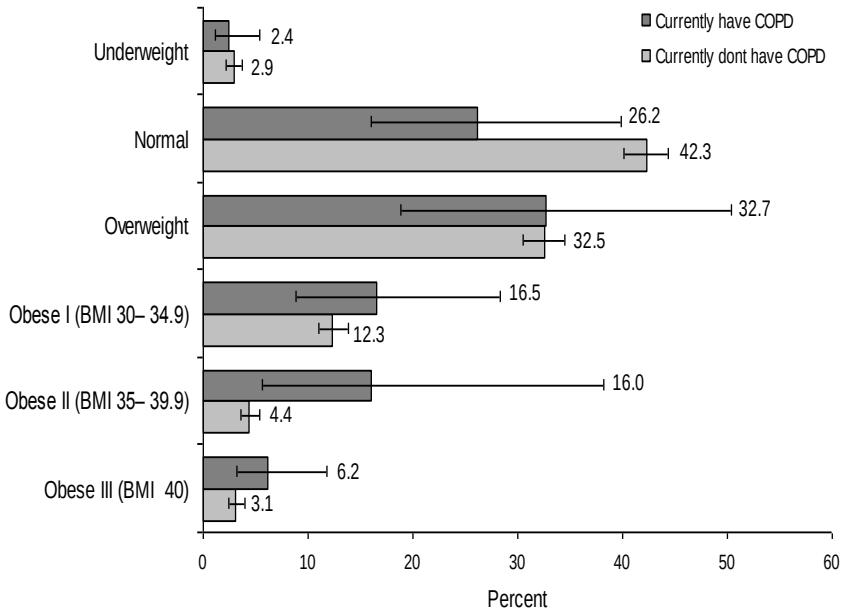
SOURCE: Hawai‘i BRFSS - Hawai‘i State Department of Health

Those who reported asthma were 10.3 times more likely to also have COPD. Those who reported diabetes were 1.7 times more likely to also have COPD. Those who reported heart disease were 2.9 times more likely to also report COPD. Those respondents who reported a chronic disease were 6.8 times more likely to also report COPD than those who did not report chronic disease. This is based on adjusted odds ratios calculated by adjusting for age, gender, ethnic group, marital status, education and employment using the BRFSS data. Refer to tabular data in Appendix C for more information.

[7] Self-reported COPD and Asthma are often confused in adults. The majority of respondents who reported never smoking and also reported COPD were probably misdiagnosed, and most likely have asthma, not COPD.

Figure 15. Prevalence of Body Mass Index by COPD Status, HHS, Hawai‘i 2007*

- On the HHS, adults with COPD were more likely to also report higher levels of obesity (BMI 30-34.9, BMI 35-39.9 and BMI 40 and above)[8].

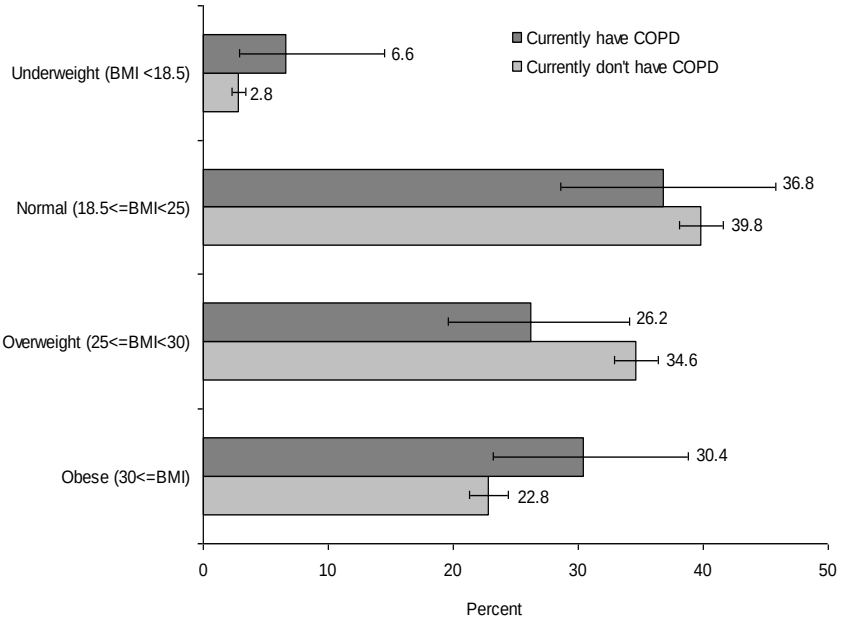


* Age adjusted to Census 2000

SOURCE: HHS - Hawai‘i State Department of Health

Figure 16. Prevalence of Body Mass Index by COPD Status, BRFSS, Hawai‘i 2008

- On the BRFSS, adults with COPD were more likely to also report being obese (BMI≥30) than those who did not report COPD (30.4% vs. 22.8%), although this finding was not statistically significant.
- Adults with COPD were also more than twice as likely to report being underweight than those without COPD on the BRFSS (6.6% vs. 2.8%).



SOURCE: Hawai‘i BRFSS – Hawai‘i State Department of Health

Those who reported being obese (BMI≥30) were 1.2 times more likely to also report COPD compared to those who reported normal body mass index (18.5<=BMI<=25). This is based on adjusted odds ratios calculated from the BRFSS. However, the 95% CI for the adjust odds ratio is 0.7% to 2.1%

[8] The HHS uses the Federal guidelines for the "clinical definition" of overweight and obese developed by The National Heart, Lung and Blood Institute (NHLBI). See Appendix A for more details.

and thus not statistically significantly different from the obesity prevalence of adults without COPD after controlling for age, gender, ethnic group, marital status, education and employment. Refer to tabular data in Appendix C for more information.

SMOKING PREVALENCE TRENDS

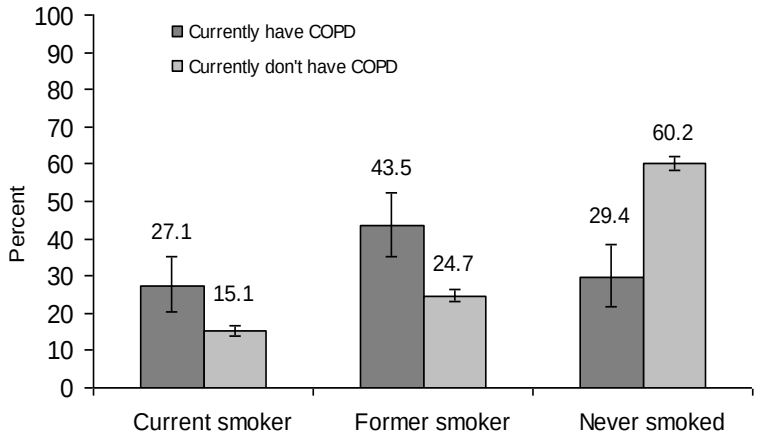
COPD morbidity and mortality rates in Hawai‘i generally mirror trends in smoking, with a lag time in both morbidity and mortality for women. Smoking rates have been decreasing steadily for several years; however COPD rates are likely increasing due to the aging of Hawai‘i’s population and given the large numbers of people who smoked in the past, especially among Hawai‘i’s diverse groups.

Data from the BRFSS show that the overall reported smoking rate for Hawai‘i is 15.4%; a decrease from 17.5% in both 2006 and 2007 and down from 18.7% in 1997. Smoking among men is now at 18.2%, down from 19.7% in 2007, as is reported smoking among women, which decreased from 15.9% in 2006 to 12.7% in 2008. There were decreases in smoking rates among most age groups; however, those aged 25-34 continue to have some of the higher reported smoking rates (20.8%). In 2008, all ethnic groups show decreases in reported smoking from previous years, although smoking rates are highest among Filipino men (25.3%) and Native Hawaiian women (22.9%). Japanese women have the lowest smoking rate at 8.8%. Health disparities persist as well, with on-going higher smoking rates among people who are unmarried, or unemployed, and, or among those with less education and/or with low income.

Current smokers were 3.4 times more likely than those who have never smoked to also report COPD, while former smokers were 2.8 times more likely to also report COPD than those who have never smoked. This is based on adjusted odds ratios calculated from the BRFSS (adjusted for age, gender, ethnic group, marital status, education and employment).

Figure 17. Prevalence of Adults Who Reported Smoking Tobacco by COPD Status, BRFSS, Hawai‘i 2008

- Among adults who reported COPD, more than one-fourth were current smokers (27.1%) whereas only 15.1% of adults without COPD reported being current smokers.
- Alternatively, close to a third of adults who reported COPD never smoked, which is half the rate for adults without COPD (29.4% vs. 60.2%).[9]

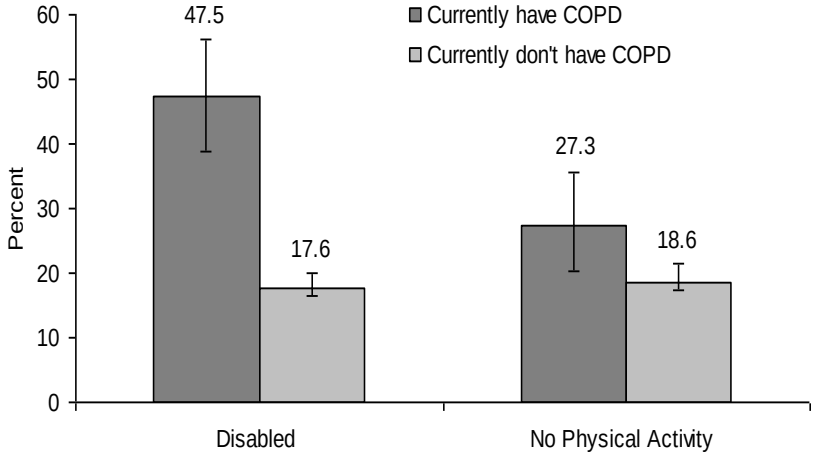


SOURCE: Hawai‘i BRFSS – Hawai‘i State Department of Health

PREVALENCE ESTIMATES BY PHYSICAL ACTIVITY & DISABILITY

Figure 18. Prevalence of Adults Who Reported Physical Disability or No Physical Activity by COPD Status, BRFSS, Hawai‘i 2008

- On the BRFSS, adults who reported COPD were more than twice as likely to report being disabled (with activity limitation or use special equipment) compared to those without COPD (47.5% vs. 17.6%) ($p<0.05$).
- Adults who reported COPD were more likely to also report no physical activity (27.3% vs. 18.6%) compared to those without COPD (non-significant).



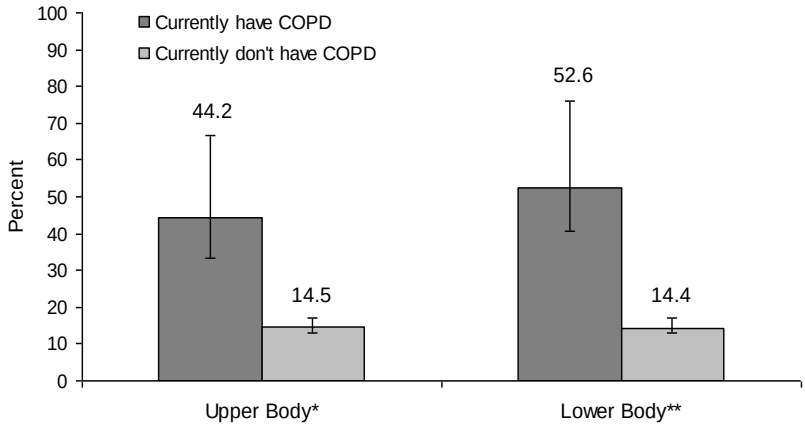
SOURCE: Hawai‘i BRFSS – Hawai‘i State Department of Health

[9] Self-reported COPD and asthma are often confused in adults (Swanney et al, 2008; Vollmer et al, 2009). The majority of respondents who reported never smoking and also reported COPD were probably misdiagnosed, and most likely have asthma, not COPD.

Those who reported being disabled (with activity limitation or use of special equipment) were 2.6 times more likely to also report COPD than those who reported no disability. Those who reported no leisure time physical activity were 1.5 times more likely to also report COPD than those who reported having leisure time physical activity. This is based on adjusted odds ratios calculated from the BRFSS (adjusted for age, gender, ethnic group, marital status, education and employment). Refer to tabular data in Appendix C for more information.

Figure 19. Prevalence of Adults Who Reported Limitations from Performing Moderate Activities on a Typical Day by COPD Status, HHS, Hawai‘i 2007*

- On the HHS, adults with COPD were several times more likely to also report mobility limitations as those who did not report COPD ($p<0.05$).
- This included activities associated with the upper body (*moving a table, pushing vacuum cleaner, bowling, playing golf) as well as those associated with the lower body (**climbing several flights of stairs) ($p<0.05$).



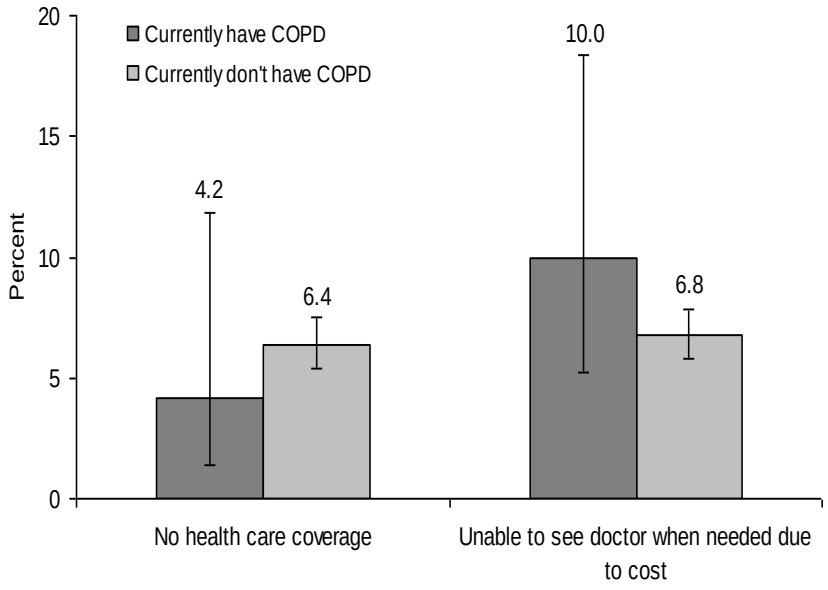
***** Weighted and adjusted for total population of Hawai`i

SOURCE: HHS - Hawai‘i State Department of Health

PREVALENCE ESTIMATES - LACK OF HEALTHCARE COVERAGE AND ACCESS TO CARE

Figure 20. Prevalence of Adults Who Reported Lack of Health Care or Lack of Access to Healthcare by COPD Status, BRFSS, Hawai‘i 2008

- According to the BRFSS, the prevalence of no health care coverage was higher among adults who reported no COPD than among adults with reported COPD (6.4% vs. 4.2%), but the difference was not statistically significant.
- About 10% of adults who reported COPD vs. 6.8% of adults with no COPD reported that in the past 12 months there was a time they needed to see a doctor but could not due to cost. However, the difference between the two rates was not statistically significant.



SOURCE: Hawai‘i BRFSS – Hawai‘i State Department of Health

Those who reported they did not see a doctor during the year when they needed due to cost were also 1.4 times more likely to also have COPD than those who reported they were able to see a doctor as needed. This is based on adjusted odds ratios calculated from the BRFSS (adjusted for age, gender, ethnic group, marital status, education and employment). Refer to tabular data in Appendix C for more information.

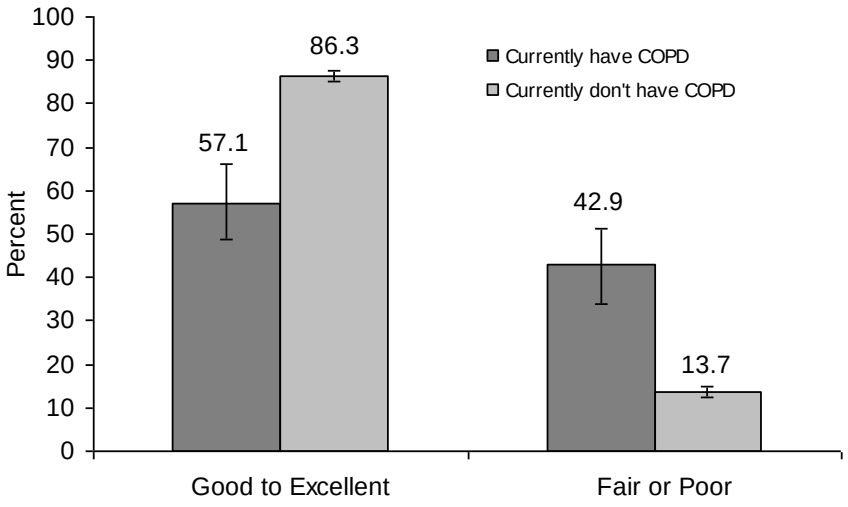
PREVALENCE ESTIMATES - HEALTH RELATED QUALITY OF LIFE

According to the BRFSS results, those who reported having COPD were more likely to report fair or poor health and also reported being more dissatisfied with life. Those respondents who reported having COPD also report frequent physical and mental health distress, and that their health adversely impacted their activity level and sleep. These results are especially salient for residents of Hawai‘i, given that COPD has a profound effect on quality of life (Rennard et al, 2002).

Those who reported fair or poor health were 3.3 times more likely to also report COPD than those who reported good or excellent health. Those who reported being dissatisfied or very dissatisfied with life were 2.4 times more likely to also report COPD compared to those who reported being satisfied or very satisfied with life. This is based on adjusted odds ratios calculated from the BRFSS (adjusted for age, gender, ethnic group, marital status, education and employment).

Figure 21. Prevalence of Self-Reported Health Status by COPD Status, BRFSS, Hawai‘i 2008

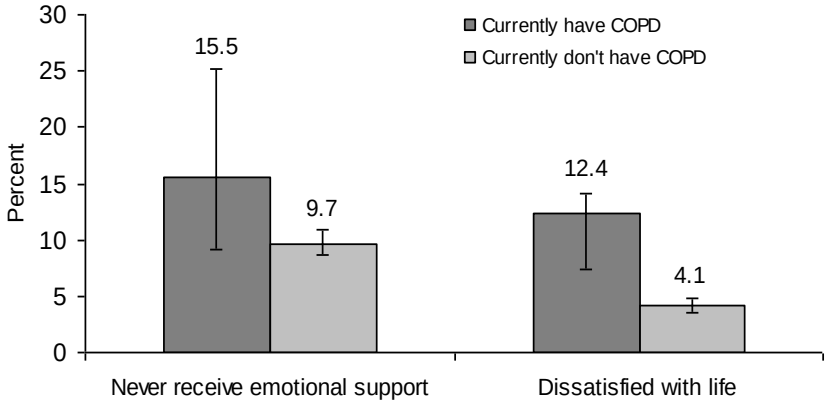
- On the BRFSS, the proportion of those with COPD who reported fair or poor health was three times higher than those with no reported COPD (42.9% vs. 13.7%).
- Conversely, those with COPD were less likely to report good or excellent health than those with no reported COPD (57.1% vs. 86.3%).



SOURCE: Hawai‘i BRFSS – Hawai‘i State Department of Health

Figure 22. Prevalence of Adults Reporting Lack of Social Support or Dissatisfaction with Life by COPD Status, BRFSS, Hawai‘i 2008

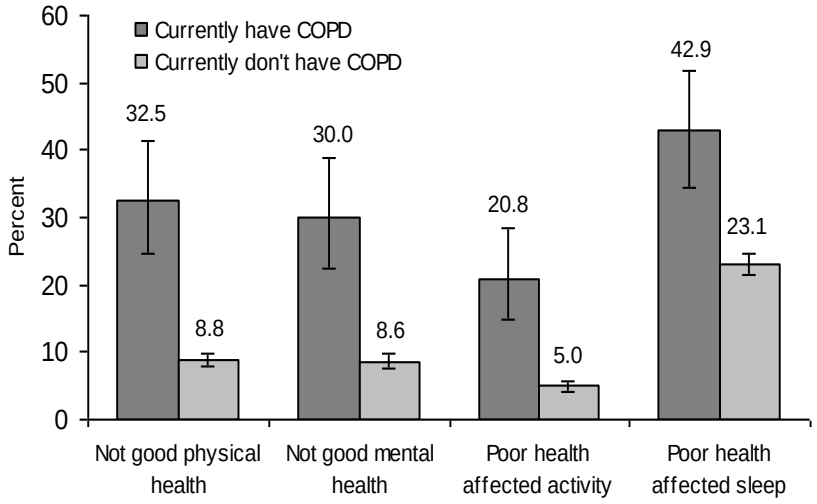
- On the BRFSS, those adults who reported COPD were more likely to report lack of social support (15.5% vs. 9.7%). However, this finding was not statistically significant.
- Those who reported COPD were also more likely to report being dissatisfied with life compared to those without COPD (12.4% vs. 4.1%).



SOURCE: Hawai‘i BRFSS – Hawai‘i State Department of Health

Figure 23. Prevalence of Adults with at Least 14 to 30 Days of "Not Good Physical/Mental Health" or "Poor Health Affecting Activity and Sleep" by COPD Status, BRFSS, Hawai'i 2008

- On the BRFSS, adults who reported COPD were more than three times more likely than adults who reported no COPD to report having 14 to 30 days of not good physical and mental health (30% vs. 8.6%). .
- Adults who reported COPD were more likely to also report that poor health affected both activity level (20.8% vs. 5.0%) and sleep capacity (42.9% vs. 23.1%).



SOURCE: Hawai'i BRFSS – Hawai'i State Department of Health

Those who reported frequent "physical distress" (having 14 plus of days of not good physical health in past 30 days) were 4.4 times more likely to also report COPD than those who reported no physical distress. Those who reported frequent "mental distress" (having 14 plus days of not good mental health in past 30 days) were 4.5 times more likely to also have COPD than those who reported no mental distress. Those who reported that "poor health affected activity" (having 14 plus days of poor health affecting activity level in past 30 days) were 4.3 times more likely to also experience COPD and those who reported poor health affected their sleep (having 14 plus days of poor health affecting sleep on past 30 days) were 3.5 times more likely to also experience COPD than those who reported no deleterious effects. This is based on adjusted odds ratios calculated from the BRFSS (adjusted for age, gender, ethnic group, marital status, education and employment). Refer to tabular data in Appendix C for more information.

HOSPITAL DISCHARGES & EMERGENCY DEPARTMENT VISITS

The hospital and emergency department (ED) data for COPD prevalence comes from the Hawai‘i Health Information Corporation (HHIC) and is obtained from their APR-DRG codes for COPD. “APR-DRG” codes are “diagnostic related groups” which are comprised of ICD9 codes grouped together to define a category by the HHIC. The APR-DRG for chronic obstructive pulmonary disease (COPD) does not include other pulmonary groupings such as asthma or pneumonia and is specifically a diagnostic grouping for COPD. The numbers provided below provide additional information regarding the burden of COPD based on hospital discharges and ED visits.

In 2008 there were 9,462 hospitalizations listed as a pulmonary APR-DRG, of which 1,595 were specifically for COPD. In 2008, those discharged from the hospital with a primary diagnosis of COPD had an average length of stay of about 5 days, an average charge per day of $3,810, and the average charge per discharge was $20,427. The total charges for COPD hospital discharges was over $30 million in 2008. Two-thirds (63.8%) of the hospital charges were billed to Medicare, with 16% billed to private insurers, and 12.2% billed to Medicaid/QUEST. In the past ten years, both the average charge per day and the average charge per discharge for COPD hospitalizations have almost doubled.

In 2008 there were 329,208 ED visits of which 1,294 were for COPD (not including in-patient admissions to the hospital) and another 1,134 admitted to the hospital via the ED. Almost one-half (46.7%) of COPD ED visits resulted in hospital admission. Charges for ED visits for COPD, not including in-patient admissions, were almost $3 million ($2,998,459), and an additional $22,905,349 in charges for those who were admitted to the hospital from the ED. Similar to the hospital charges, most of the charges were billed to Medicare (63.6%), with 15.2% billed to private insurance and 13.7% to Medicaid/QUEST.

NEXT STEPS & CONCLUSIONS

Focus on Health Disparities

Globally, poorer populations tend to have higher risk of developing COPD than their wealthier counterparts (Mannino & Buist, 2007). Depending on where the individual is on the spectrum of socioeconomic status and the associated risk markers of age, gender, and presence of co-morbid health conditions reflect health inequities which may further increase risk of COPD.

These features also hold true for Hawaii. Prevalence rates for COPD in Hawaii are highest among those unable to work (approximately 11% on the BRFSS), followed by those who have low household incomes of less than $15,000 per year (9.8% on the BRFSS). Based on data from the Hawaii Health Survey (HHS), the prevalence of COPD is 5.3% for those living below the poverty level according to guidelines created by Health and Human Services – which is almost triple the prevalence when compared to middle and high income levels (HHS, 2007).

As mentioned previously, those who are 65 and older are 29.02 times more likely to report COPD. By ethnicity, on the BRFSS, Whites are significantly more likely to report higher doctor diagnosed COPD prevalence at 4.6%, followed by Native Hawaiians at 3.8% and Chinese and Filipinos at 2.2% respectively. On the HHS, Chinese, Native Hawaiians and Whites and also report the highest prevalence of doctor diagnosed COPD.

What Can Be Done - COPD Preventive Care Practices

Because tobacco smoking is the greatest risk factor for COPD, and the prevalence rate for those with COPD who smoked was 71% in 2008 (43.5% former smokers, 27.1% current smokers), tobacco cessation is the primary preventive measure for residents of Hawai‘i.

For those who have been diagnosed with COPD, the most cost-effective interventions are those which improve outcomes by decreasing symptoms and preventing acute exacerbations, reduce risk of hospitalizations, improve symptom control, delay disease progression and reduce the risk of comorbidities

(Halpern et al, 2003). These interventions are more salient in Hawai‘i, where social, economic, and demographic variation interspersed with a rapidly expanding older adult population means that COPD prevalence, morbidity, and mortality will continue to increase in the years ahead. Please refer to Appendix B for COPD Treatment and Disease Management recommendations.

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Appendix A: Glossary & Data Definitions

Glossary

Age-Adjusted Rates - The risk of developing COPD and some associated risk factors generally increases with age (e.g. high blood pressure). As a result, various groups within a population that have an older age structure or distribution will have higher rates of disease. To address this issue, the mortality and prevalence rates presented in this report have been "age-adjusted." This statistical technique allows comparison of rates between groups by applying a standard weight to the age distributions that may exist between these groups. Age-adjustment also enables comparison of the rates in this report to rates from other states and the nation that use similar methods. In this report, mortality and prevalence rates are adjusted using the direct method to the 2000 U.S. standard population. Data comparisons should be limited to data adjusted to the same standard population. Rates that are not age-adjusted are considered ***crude***.

Asthma - An inflammatory disorder of the airways, which causes attacks of wheezing, shortness of breath, chest tightness, and coughing.

Arthritis - Inflammation of one or more joints, which results in pain, swelling, stiffness, and limited movement.

Body Mass Index (BMI) - A measure used in classifying weight categories and to determine overweight and obesity. BMI equals weight in kilograms ÷ [height in meters]² with a BMI of 18.5-24.9 considered normal, 25-29.9 considered overweight, and 30 or more considered obese.

Chronic Disease - In medicine, a chronic disease is a disease that is long-lasting or recurrent. The term chronic describes the course of the disease, or its rate of onset and development. Chronic diseases are the leading causes of death and disability in the United States. Nearly one in two Americans (133 million) has a chronic medical condition of one kind or another,[10] and chronic illnesses cause about 70% of deaths in the United States and take up about 75% of the costs each year.[11]

Confidence Intervals - A confidence interval is a range that contains the true population prevalence estimate with a certain degree of assurance when repeated sampling of the population is performed. The degree of assurance commonly used is 95%. For example, if we set our confidence interval at 95%, then we can expect that 5 out of 100 times the estimates coming from our samples will fall outside the range that contains the true population value. However, 95% of the time our estimates will fall within the correct range. This is known as a 95% confidence interval. Confidence intervals are used to assess if there are differences in prevalence among defined subgroups. It is a quick and simple way to determine if such differences are potentially significant (statistically).
Emergency department, hospital discharge, and mortality rates were not derived from samples. Instead they represent the actual population number. As such, confidence intervals were not computed.

Diabetes - Diabetes mellitus is a group of diseases characterized by high levels of blood glucose (blood sugar). In a person with diabetes, the normal use of food for energy is disrupted because of defects in insulin production, insulin action, or both. Insulin is a hormone which assists with the uptake of glucose

[10] *Chronic Conditions: Making the Case for Ongoing Care*. Robert Wood Johnson Foundation & Partnership for Solutions: Johns Hopkins University, Baltimore, MD for the Robert Wood Johnson Foundation (September 2004 Update). Available at: http://www.rwjf.org/qualityequality/product.jsp?id=14685

[11] CDC. Chronic Disease Prevention and Health Promotion. Available at: http://www.cdc.gov/chronicdisease/index.htm.

into the body's cells. When insulin defects are present, the normal pathway of energy production is disrupted and high blood glucose levels result.

High Blood Cholesterol (HBC) - People with high blood cholesterol (too much cholesterol in the blood) have a greater chance of getting heart disease. High blood cholesterol on its own does not cause symptoms; so many people are unaware that their cholesterol level is too high. Cholesterol can build up in the walls of arteries (blood vessels that carry blood from the heart to other parts of the body). This buildup of cholesterol is called plaque. Over time, plaque can cause narrowing of the arteries. This is called atherosclerosis, or hardening of the arteries. Special arteries, called coronary arteries, bring blood to the heart. Narrowing of your coronary arteries due to plaque can stop or slow down the flow of blood to your heart. When the arteries narrow, the amount of oxygen-rich blood is decreased. This is called coronary heart disease (CHD). Large plaque areas can lead to chest pain called angina. Angina happens when the heart does not receive enough oxygen-rich blood. Angina is a common symptom of CHD. Some plaques have a thin covering and can burst (rupture), releasing cholesterol and fat into the bloodstream. The release of cholesterol and fat may cause your blood to clot. A clot can block the flow of blood. This blockage can cause angina or a heart attack.[12]

High Blood Pressure (HBP) - A condition in which pressure in arterial circulation is greater than desired. Blood pressure numbers include systolic and diastolic pressures. Systolic blood pressure is the pressure when the heart beats while pumping blood. Diastolic blood pressure is the pressure when the heart is at rest between beats. Blood pressure is often measured with the systolic number above or before the diastolic, such as 120/80 mmHg. (The mmHg is millimeters of mercury—the units used to measure blood pressure). Blood pressure is considered high when systolic pressure is 140 mm Hg and higher OR diastolic pressure is 90 mm Hg and higher.[13]

Health Disparities - Population-specific differences in the burden and impact presence of disease, health outcomes, or access to health care. These can be gaps across racial, ethnic, population and socioeconomic groups.

Morbidity - Generally defined as the proportion of sickness or of a specific disease in a geographical locality.

Mortality - The number of deaths in a given time or place, or the proportion of deaths to population.

Mortality Rate - The number of deaths within a defined population during a specified interval of time.

Prevalence - The number of persons with a self-reported disease or condition (existing cases) at a specific point in time divided by the total number of persons in the population at that same point in time. In this report, prevalence is presented as the **percent** of adults with a disease or condition (e.g. COPD, diabetes, high blood pressure) within a given year.

P-value (Statistical Significance) - A p-value represents the probability that the observed result from a sample is due to chance alone (occurred at random). A p-value less than 0.05 is considered statistically significant. This means that the observed differences between two values have less than a 5% probability

[12] National Heart Lung and Blood Institute, 2008. What Is High Blood Cholesterol? Available from: http://www.nhlbi.nih.gov/health/dci/Diseases/Hbc/HBC_WhatIs.html.
[13] National Heart Lung and Blood Institute, 2008. What Is High Blood Pressure? Available from: http://www.nhlbi.nih.gov/health/dci/Diseases/Hbp/HBP_WhatIs.html.

of occurring by chance, assuming that the two values should not be different at all. In this report, statements of statistical significance are followed by p<.05 to denote the p-value.

Reliability - refers to the consistency of a survey. If sample denominators were less than 50 or the relative standard error was greater than 35, then data are indicated to not be reliable estimated based on sample sizes or high variability.

Social Determinants of Health - Social and environmental conditions that affect health and well-being. These can include housing and neighborhoods; safe schools and play areas; access to healthy food; income and work conditions; and sanitation and environmental quality.

Weighted Percent - A percentage that has been calculated based upon the final weight in BRFSS and HHS survey data. The final weight takes into account the unequal probability of selection, differential non-response, and possible deficiencies in the sampling frame.

Data Definitions

Behavioral Risk Factor Surveillance System (BRFSS)

Community (sub-county geographic areas) - is defined by the aggregation of adjacent zip codes with at least one school complex in the area. A list of the community zip codes can be found on the following website: http://Hawai'i.gov/health/statistics/brfss/others/subarea.html.

Ethnicity - Respondents are asked to choose up to six ethnicities from the ethnicity list following the question: "Which one or more of the following would you say is your ethnicity?" This question is followed up by another question when more than one ethnicity is mentioned. "Which one of these groups would you say best represents your ethnicity?" The ethnicity list includes White, Hawaiian, Chinese, Filipino, Japanese, Korean, Samoan, Black, American Indian/Alaska Native/Eskimo/Inuit, Vietnamese, Asian Indian, Portuguese, Guamanian/Chamorro, Puerto Rican, Mexican, Tongan, Laotian, Cambodian, Malaysian, Fijian, Micronesian and other Asian. In addition, a respondent can specify their own ethnicity if it is not listed, or they can say they don't know, they are not sure, or they refuse to answer. For simplicity, this document re-categorizes race/ethnicity into White (includes Portuguese), Hawaiian, Filipino, Japanese and "Others" (includes Chinese).

Frequent mental distress - Defined as at least 14 days of not good mental health is labeled as frequent mental distress (FMD). This 14 day minimum period was selected because physicians and clinical researchers often use a similar period as a marker for clinical depression and anxiety disorders.[14]

Smoking Status - The Hawai'i BRFSS defines a current smoker as a person who responds "yes" to currently smoking every day or some days. The Hawai'i BRFSS defines a former smoker as a person who has smoked at least 100 cigarettes in their lifetime, but no longer smokes.

[14] CDC. Self-reported frequent mental distress among adults—United States, 1993—1996 MMWR 1998; 47:326—31.

Hawai'i's Health Survey (HHS)

Age - The age at the last birthday was provided for each household member by the adult respondent. If age is missing, it is imputed using a 'hot deck' method. The missing ages are less than 2.0% of the sample.

Body Mass Index (BMI) - BMI was defined as weight in kilograms divided by height in meters squared (kg/m2).1 Height and weight is asked only of the Respondent, thus data are for only the population aged > 18 years. The obesity measure is based on Body Mass Index (BMI). BMI is defined as weight in kilograms divided by height in meters squared (kg/m2). The National Heart, Lung and Blood Institute (NHLBI) (June 17, 1998) released the federal guidelines for the "clinical definition" of overweight and obese[15]:

BMI Categories:

- Underweight <18.5
- Normal 18.5-24.9
- Overweight 25.0-29.9
- Obese I 30.0-34.9
- Obese II 35.0-39.9
- Obese III ≥40.0

Disability-Adjusted Life Years (DALYs) - Originally developed by the World Health Organization, the disability-adjusted life year (DALY) is a measure of overall disease burden. DALYs combine mortality and morbidity into a single metric. One DALY can be thought of as one lost year of "healthy" life. The sum of DALYs across the population can be thought of as a measurement of the gap between current health status and an ideal health situation where the entire population lives to an advanced age, free of disease and disability. In the formula **DALY = YLL + YLD**, YLL represents Years of Life Lost due to premature mortality in the population and YLD represents Years Lost due to Disability for incident cases of the health condition. DALYs are calculated by taking the sum of these two components.[16] [17]

Educational Status - The adult respondent provides the marital status for everyone aged eighteen years and greater in the household. The responses are coded not a high school graduate, high school graduate/ GED, 1-3 years of college, college graduate and unknown.

Ethnicity - In the HHS, ethnicity is self identified and also the parent ethnicity is coded with multiple responses possible for the mother and the father. The Respondent lists up to four ethnicities for both their (and for each household member) mother and their father. The responses are coded to White, Hawaiian, Chinese, Filipino, Japanese, Korean, Samoan/Tongan, Black/African American, Native American/Aleut/Eskimo/Inuit, Vietnamese, Asian Indian, Portuguese and/or Guamanian/Chamorro. In 2000 the responses Puerto Rican, Mexican, other Pacific Islander and Other Asian were added. The

[15] National Heart, Lung and Blood Institute in cooperation with National Institute of Diabetes and Digestive and Kidney Diseases. *Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults. The Evidence Report.* NIH Publications No. 98-4083. 1998. U.S. Department of Health and Human Services.

[16] *Disability-adjusted life year*, From Wikipedia, the free encyclopedia. Retrieved from: http://en.wikipedia.org/wiki/Disability-adjusted_life_year on May 5, 2010.

[17] World Health Organization. Metrics: Disability-Adjusted Life Year (DALY): Quantifying the Burden of Disease from mortality and morbidity. Retrieved from http://www.who.int/healthinfo/global_burden_disease/metrics_daly/en/index.html on May 5, 2010.

respondent can also specify another ethnicity if it is not listed, reply they do not know, or refuse to answer.

In this report, parent ethnicity is coded to one response based on OHSM algorithm of coding. OHSM codes these eight possible responses for each individual to one ethnicity in order to comply with prior Census rules coding race/ethnicity[18]. Specifically, if Hawaiian is listed for the mother or father the person is coded to Hawaiian. Otherwise, the person is coded to the first ethnicity listed (other than White or unknown) for the father. If the father's responses are White and/or unknown, the person's ethnicity is coded to the first ethnicity listed (other than White or unknown) for the mother. Lastly, if there are no other responses other than White or unknown the person is coded to Caucasian. Otherwise, the person is coded to do not know, refused, or missing.

Health Related Quality of Life Questions - SF-12® Version Two questions (a shortened 12 questionnaire from the SF-36® questionnaire) are related to self reported general health, limitations caused by physical and/or emotional problems, pain limiting activities, limitations to amount and type of work and limitations in social activities due to health problems.[19]

Marital Status - The adult respondent provides the marital status for everyone aged fifteen years and greater in the household. The responses are coded into married, divorced, separated, never married and too young to be married.

Poverty Status - Poverty status is determined by using the "poverty guidelines" and takes into account not only income but also household size supported by the income. Thus, it is a more useful indicator of actual personal income. It is reported for the household and, or the household members. Poverty guidelines are updated annually in the Federal Register by the U.S. Department of Health and Human Services. The poverty guidelines are designated for the year in which they are issued and reflect price changes for the prior year. The Hawai‘i Health Survey income question is asked also of the prior year. Thus, the 2004 Federal Poverty Guidelines were used for 2004 income data to compute percent poverty levels for 2004. Households below 100 percent of the guideline are said to be below the poverty guideline. Individuals in those households are said to be “living below poverty”.[20] Poverty levels for persons of unknown income were listed as unknown.

Reliability - If sample denominators are less than 50 or the relative standard error is >35 then data are indicated to not be reliable estimates based on small sample sizes or high variability.

Smoking Status - Smoking status can be determined by several questions including; Does anyone in your household smoke cigarettes? What are the names (initials) of those household members? In the past 30 days, has anyone, including yourself, smoked cigarettes, cigars or pipes inside your home?

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[18] Interagency Committee for the Review of Standards for Data on Race and Ethnicity. Tabulation Working Group. *Draft Provisional Guidance on the Implementation of the 1997 Standards for Federal Data on Race and Ethnicity.* 1999; 2-17.

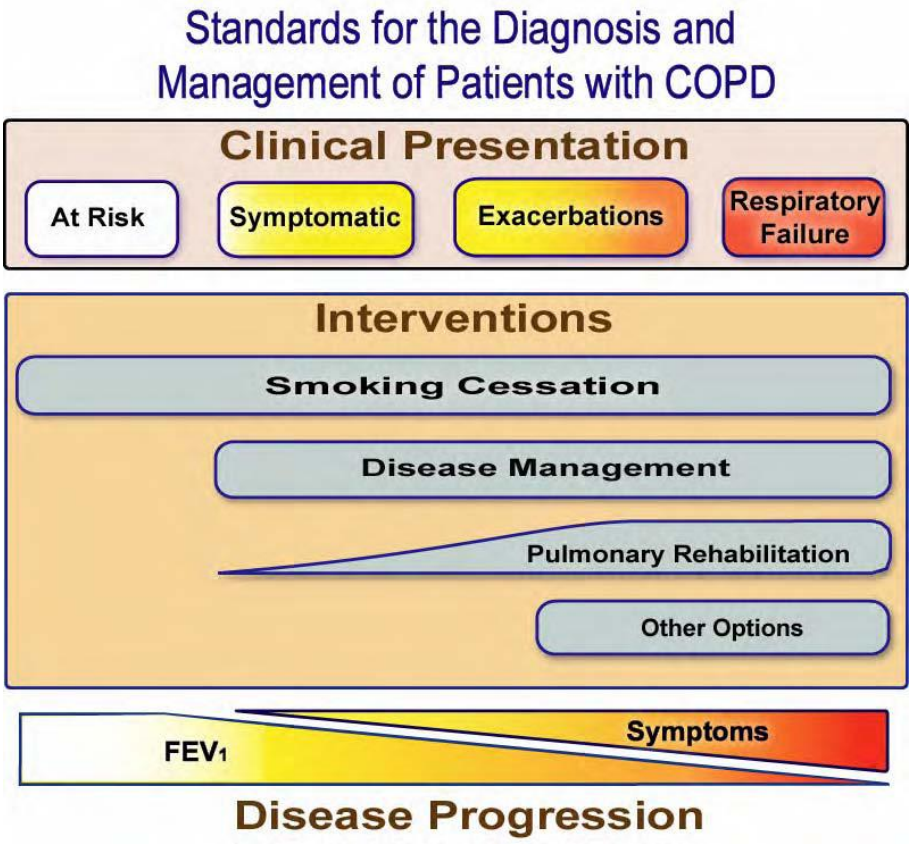
[19] Ware, J.E., Kosinski, M., Keller, S.D. *SF-12®: How to Score the SF-12® Physical and Mental Health Summary Scales.* Lincoln, RIO: Quality Metric Incorporated, Third Edition, 1998.

[20] U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation. *Poverty Guidelines - Research and Measurement.* 2000; 1-2. http://aspe.hhs.gov/poverty/poverty.htm

Appendix B: COPD Treatment and Disease Management

Due to the complexity of co-morbidities and the similarity to other respiratory conditions, COPD can be very hard to diagnose. It has been widely established that COPD is often under-recognized, under-diagnosed and under-treated (Shak & Nordyke, 2004; Chapman et al, 2006; Centers for Disease Control and Prevention, 2009). Therefore, clear standards and operational methodology are necessary for effective diagnosis and management of COPD. The navigation diagram below depicts such a template produced by the American Thoracic Society and the European Respiratory Society Task Force.

Figure 25. Standards for the Diagnosis and Management of Patients with COPD, Context-Specific Navigation Diagram, 2004



Source: American Thoracic Society / European Respiratory Society Task Force, 2004

For the management of stable COPD, the American Thoracic Society recommends the following: smoking cessation, pharmacological therapy, long-term oxygen therapy (LTOT), pulmonary rehabilitation, nutritional therapy combined with physical exercise, surgery, minimizing sleep disturbance, and utilizing extra oxygen during long or extended air travel (American Thoracic Society / European

Respiratory Society Task Force, 2004). Integrated disease management is also recommended for primary care, with more information available on the American Thoracic Society website. Once COPD is diagnosed, chronic disease management programs should work to prevent further deterioration in lung function and reduce COPD mortality (Celli, 2008). To decrease the number and rate of COPD deaths, public health programs should continue efforts to reduce all personal exposure to 1) tobacco smoke, including passive smoke exposure; 2) occupational dusts and chemicals; and 3) other indoor and outdoor air pollutants linked to COPD (Miller et al, 2005).

It is notable that as of the date of the publication, the only known pulmonary rehabilitation program in the state of Hawai‘i is operated by the Veterans Administration. Pulmonary rehabilitation is listed as an important treatment that helps patients with physical activity and integrated disease management. All other cardiopulmonary rehabilitation programs have been shut down. It is also notable that effective January 1, 2010, Medicare will reimburse for cardiopulmonary rehabilitation of COPD patients.

Appendix C: Data Tables

Behavioral Risk Factor Surveillance System (BRFSS)

Table 1.

Ever been told by a doctor or health professional that you have chronic obstructive pulmonary disease (COPD)?

	Yes				No				Total sample size	Estimated population
	Sample size	Weighted percent	Lower 95% limit	Higher 95% limit	Sample size	Weighted percent	Lower 95% limit	Higher 95% limit		
Total	246	3.2	2.7	3.8	5947	96.8	96.2	97.3	6,193	955,138
AGE GROUP										
18-34 Years	11	1.6	0.8	3.1	870	98.4	96.9	99.2	881	289,017
35-44 Years	22	2.0	1.2	3.3	975	98.0	96.7	98.8	997	170,405
45-54 Years	46	3.6	2.5	5.1	1,245	96.4	94.9	97.5	1,291	168,824
55-64 Years	67	4.0	3.0	5.4	1,302	96.0	94.6	97.0	1,369	145,682
65+ Years	100	6.1	4.7	7.9	1,524	93.9	92.1	95.3	1,624	176,621
GENDER										
Male	95	2.9	2.2	3.9	2422	97.1	96.1	97.8	2,517	470,288
Female	151	3.5	2.8	4.4	3525	96.5	95.6	97.2	3,676	484,850
ETHNICITY										
White	134	4.6	3.6	5.8	2493	95.4	94.2	96.4	2,627	317,872
Hawaiian	37	3.8	2.4	6.0	719	96.2	94.0	97.6	756	132,340
Chinese	8	2.2	1.0	4.8	335	97.8	95.2	99.0	343	65,209
Filipino	21	2.2	1.2	4.0	665	97.8	96.0	98.8	686	133,230
Japanese	31	2.1	1.4	3.2	1313	97.9	96.8	98.6	1,344	219,575
Others	13	2.4	1.0	5.6	402	97.6	94.4	99.0	415	84,300
MARITAL STATUS										
Married	115	2.9	2.3	3.7	3353	97.1	96.3	97.7	3,468	560,636
Unmarried	131	3.7	2.8	4.8	2576	96.3	95.2	97.2	2,707	392,769
EDUCATION										
<High School	15	3.8	1.9	7.4	297	96.2	92.6	98.1	312	45,946
High School	79	3.7	2.7	5.1	1559	96.3	94.9	97.3	1,638	279,973
Some College	87	4.3	3.2	5.6	1657	95.7	94.4	96.8	1,744	271,811
College	65	2.0	1.5	2.7	2431	98.0	97.3	98.5	2,496	356,995
EMPLOYMENT										
Employed	97	2.1	1.6	2.6	3572	97.9	97.4	98.4	3,669	605,628
Unemployed	14	6.9	3.2	14.5	183	93.1	85.5	96.8	197	40,596
Unable to work	33	11.3	7.0	17.7	219	88.7	82.3	93.0	252	35,093
Retired	88	4.9	3.7	6.4	1558	95.1	93.6	96.3	1,646	181,047
Stud/Homemaker	14	3.0	1.4	6.1	412	97.0	93.9	98.6	426	92,368
HOUSEHOLD INCOME										
<$15,000	41	9.8	5.9	15.8	376	90.2	84.2	94.1	417	45,846
$15,000-24,999	33	2.2	1.4	3.5	653	97.8	96.5	98.6	686	89,416
$25,000-49,999	74	4.0	3.0	5.4	1532	96.0	94.6	97.0	1,606	237,221
$50,000-74,999	38	3.4	2.3	5.2	1091	96.6	94.8	97.7	1,129	179,456
>=$75,000	42	1.9	1.4	2.7	1837	98.1	97.3	98.6	1,879	313,769
Unknown/Refused	11	3.4	1.5	7.4	255	96.6	92.6	98.5	266	62,129
COUNTY										
Honolulu	101	3.0	2.4	3.8	2776	97.0	96.2	97.6	2,877	672,481
Hawaii	69	3.9	2.9	5.2	1325	96.1	94.8	97.1	1,394	129,996
Kauai	21	3.4	1.9	5.9	557	96.6	94.1	98.1	578	47,142
Maui	55	3.7	2.6	5.4	1289	96.3	94.6	97.4	1,344	105,519

Table 2.

COPD Prevalence By Selected Health Attributes

Column percent by	Had COPD					No COPD				
	Sample size	Estimated population	Weighted percent	Lower 95% limit	Higher 95% limit	Sample size	Estimated population	Weighted percent	Lower 95% limit	Higher 95% limit
GENERAL HEALTH - Total	243	30,451	100.0	.	.	5,943	923,739	100.0	.	.
Good to Excellent	141	17,385	57.1	48.2	65.6	5,041	796,885	86.3	85.0	87.4
Fair or Poor	102	13,066	42.9	34.4	51.8	902	126,854	13.7	12.6	15.0
# DAYS IN THE PAST 30 DAYS PHYSICAL HEALTH NOT GOOD - Total	244	30,428	100.0	.	.	5,890	916,324	100.0	.	.
None	101	11,694	38.4	30.5	47.1	3,869	613,430	66.9	65.2	68.6
1 to 6 days	50	6,118	20.1	14.1	27.8	1,122	178,557	19.5	18.1	20.9
7 to 13 days	14	2,732	9.0	4.7	16.4	295	43,906	4.8	4.1	5.6
14 to 30 days (Frequent physical distress)	79	9,884	32.5	24.7	41.4	604	80,430	8.8	7.8	9.8
# DAYS IN THE PAST 30 DAYS MENTAL HEALTH NOT GOOD - Total	242	30,400	100.0	.	.	5,898	917,323	100.0	.	.
None	124	14,825	48.8	40.1	57.5	4,129	631,960	68.9	67.2	70.6
1 to 6 days	32	3,432	11.3	7.5	16.7	1,001	164,680	18.0	16.6	19.4
7 to 13 days	14	3,024	9.9	5.3	17.9	266	41,686	4.5	3.8	5.4
14 to 30 days (Frequent mental distress)	72	9,119	30.0	22.5	38.8	502	78,998	8.6	7.6	9.7
# DAYS IN THE PAST 30 DAYS POOR HEALTH AFFECTED ACTIVITY - Total	243	29,969	100.0	.	.	5,909	919,225	100.0	.	.
None	143	16,463	54.9	46.1	63.5	4,735	742,118	80.7	79.3	82.1
1 to 6 days	30	4,517	15.1	9.5	23.0	644	103,422	11.3	10.2	12.4
7 to 13 days	11	2,755	9.2	4.7	17.2	194	27,908	3.0	2.5	3.7
14 to 30 days	59	6,233	20.8	14.8	28.5	336	45,777	5.0	4.2	5.8
# DAYS IN THE PAST 30 DAYS DID NOT GET ENOUGH SLEEP - Total	242	30,019	100.0	.	.	5,895	917,867	100.0	.	.
None	82	9,524	31.7	24.1	40.5	2,470	335,942	36.6	34.9	38.3
1 to 6 days	48	4,863	16.2	11.5	22.3	1,663	279,074	30.4	28.7	32.1
7 to 13 days	19	2,762	9.2	5.1	16.2	523	90,736	9.9	8.8	11.1
14 to 30 days	93	12,871	42.9	34.4	51.8	1,239	212,115	23.1	21.6	24.7
DEPRESSION BY SEVERITY SCALE (5 levels) - Total	224	27,607	100.0	.	.	5,644	882,931	100.0	.	.
Severe depression (20<=s<25)	10	688	2.5	1.2	5.1	42	5,509	0.6	0.4	0.9
(15<=s<20)	18	3,292	11.9	6.5	20.9	104	14,469	1.6	1.2	2.2
Moderate depression (10<=s<15)	28	3,291	11.9	7.0	19.6	248	39,963	4.5	3.8	5.4
Mild depression (5<s<10)	47	7,166	26.0	18.7	34.9	842	142,517	16.1	14.8	17.6
No depression (<=4)	121	13,170	47.7	38.9	56.7	4,408	680,474	77.1	75.4	78.6
DEPRESSION BY SEVERITY SCALE (2 levels) - Total	224	27,607	100.0	.	.	5,644	882,931	100.0	.	.
Current depression (10<=s<24)	56	7,271	26.3	18.7	35.7	394	59,941	6.8	5.9	7.8
No depression	168	20,336	73.7	64.3	81.3	5,250	822,990	93.2	92.2	94.1
PROVISIONAL DEPRESSIVE DISORDER - Total	224	27,607	100.0	.	.	5,644	882,931	100.0	.	.
Current major depression	33	4,139	15.0	9.2	23.5	199	29,587	3.4	2.7	4.1
Current other depression	27	3,404	12.3	7.9	18.8	289	52,032	5.9	5.0	6.9
No depression	164	20,064	72.7	63.8	80.1	5,156	801,312	90.8	89.6	91.8
LIFETIME ANXIETY - Total	245	30,765	100.0	.	.	5,930	921,386	100.0	.	.
Yes	75	8,078	26.3	19.5	34.4	555	69,753	7.6	6.7	8.5
No	170	22,687	73.7	65.6	80.5	5,375	851,633	92.4	91.5	93.3
LIFETIME DEPRESSION - Total	245	30,765	100.0	.	.	5,936	923,048	100.0	.	.
Yes	80	9,329	30.3	22.9	39.0	682	83,602	9.1	8.2	10.0
No	165	21,436	69.7	61.0	77.1	5,254	839,446	90.9	90.0	91.8

Table 2. Continued

COPD Prevalence By Selected Health Attributes

Column percent by	Had COPD					No COPD				
	Sample size	Estimated population n	Weighted percent	Lower 95% limit	Higher 95% limit	Sample size	Estimated population n	Weighted percent	Lower 95% limit	Higher 95% limit
ASTHMA STATUS - Total	239	29,473	100.0	.	.	5,910	919,492	100.0	.	.
Current asthma	103	12,729	43.2	34.6	52.2	466	79,803	8.7	7.7	9.8
Had asthma	8	2,389	8.1	3.3	18.5	318	58,734	6.4	5.5	7.4
Never had asthma	128	14,355	48.7	40.0	57.5	5,126	780,955	84.9	83.5	86.3
DIABETES - Total	246	30,794	100.0	.	.	5,940	923,431	100.0	.	.
Have diabetes	48	5,360	17.4	11.9	24.7	537	71,918	7.8	7.0	8.7
No diabetes	198	25,434	82.6	75.3	88.1	5,403	851,513	92.2	91.3	93.0
HEART DISEASE - Total	243	30,497	100.0	.	.	5,899	916,041	100.0	.	.
Had heart attack or angina heart disease, or stroke	57	7,209	23.6	16.6	32.6	464	53,520	5.8	5.2	6.6
None	186	23,289	76.4	67.4	83.4	5,435	862,520	94.2	93.4	94.8
CHRONIC DISEASE - Total	244	30,595	100.0	.	.	5,940	923,565	100.0	.	.
Have been told that you have a chronic illness	95	11,594	37.9	30.0	46.5	425	57,230	6.2	5.4	7.1
No	149	19,001	62.1	53.5	70.0	5,515	866,335	93.8	92.9	94.6
DISABILITY - Total	245	30,545	100.0	.	.	5,937	922,856	100.0	.	.
Disabled (with activity limitation or use special equipment)	132	14,496	47.5	38.9	56.1	1,275	162,339	17.6	16.4	18.9
No disability	113	16,049	52.5	43.9	61.1	4,662	760,516	82.4	81.1	83.6
BODY WEIGHT STATUS - Total	244	30,448	100.0	.	.	5,864	908,818	100.0	.	.
Under weight (BMI <18.5)	12	2,013	6.6	2.9	14.5	164	25,188	2.8	2.3	3.4
Normal weight (18.5<=BMI<25)	98	11,204	36.8	28.6	45.8	2,432	361,692	39.8	38.1	41.6
Overweight but not obese (25<=BMI<30)	61	7,970	26.2	19.6	34.1	2,005	314,727	34.6	32.9	36.4
Obese (30<=BMI)	73	9,262	30.4	23.2	38.8	1,263	207,211	22.8	21.3	24.4
SMOKING STATUS - Total	246	30,794	100.0	.	.	5,925	921,726	100.0	.	.
Current smoker	75	8,346	27.1	20.2	35.3	807	139,029	15.1	13.7	16.5
Former smoker	111	13,397	43.5	35.2	52.2	1,727	227,968	24.7	23.3	26.2
Never smoked	60	9,051	29.4	21.8	38.4	3,391	554,729	60.2	58.4	61.9
Total	242	30,313	100.0	.	.	5,897	916,661	100.0	.	.
Not at risk	208	25,108	82.8	74.3	89.0	5,034	754,797	82.3	80.7	83.8
At risk	34	5,205	17.2	11.0	25.7	863	161,864	17.7	16.2	19.3
Total	244	30,592	100.0	.	.	5,894	911,517	100.0	.	.
Not at risk	220	28,098	91.8	85.3	95.6	5,475	846,900	92.9	91.8	93.8
At risk	24	2,494	8.2	4.4	14.7	419	64,617	7.1	6.2	8.2
EXERCISE - Total	246	30,794	100.0	.	.	5,947	924,343	100.0	.	.
Had leisure time physical activity	172	22,383	72.7	64.5	79.6	4,866	752,079	81.4	79.9	82.7
None	74	8,411	27.3	20.4	35.5	1,081	172,264	18.6	17.3	20.1
COVERAGE? - Total	246	30,794	100.0	.	.	5,938	922,711	100.0	.	.
Yes	234	29,493	95.8	88.2	98.6	5,602	863,884	93.6	92.5	94.6
No	12	1,301	4.2	1.4	11.8	336	58,827	6.4	5.4	7.5
DOCTOR WHEN NEEDED BECAUSE	246	30,794	100.0	.	.	5,943	923,907	100.0	.	.
At least once in the past 12 months	24	3,069	10.0	5.2	18.4	392	62,459	6.8	5.8	7.8
None	222	27,725	90.0	81.6	94.8	5,551	861,449	93.2	92.2	94.2
SUPPORT RECEIVED - Total	243	30,614	100.0	.	.	5,901	919,376	100.0	.	.
Always/usually	166	20,676	67.5	58.4	75.5	4,561	709,548	77.2	75.6	78.7
Sometimes	46	5,190	17.0	11.9	23.6	751	120,235	13.1	11.9	14.4
Rarely/Never	31	4,747	15.5	9.1	25.2	589	89,593	9.7	8.7	10.9
LIFE? - Total	244	30,630	100.0	.	.	5,922	920,171	100.0	.	.
Satisfied to Very satisfied	216	26,845	87.6	79.9	92.7	5,661	882,553	95.9	95.2	96.5
Dissatisfied to Very dissatisfied	28	3,785	12.4	7.3	20.1	261	37,618	4.1	3.5	4.8

Table 3. (Note: AOR = adjusted odds ratio; CI = confidence interval)

Adjusted Odds Ratios (AOR) for COPD by Selected Attributes

(Adjusted by age, gender, ethnic group, marital status, education and employment)	AOR	Lower 95% limit	Higher 95% limit
GENERAL HEALTH - Total			
Good to Excellent	1.0	1.0	1.0
Fair or Poor	3.3	2.2	5.0
# DAYS IN THE PAST 30 DAYS PHYSICAL HEALTH NOT GOOD - Total			
None	1.0	1.0	1.0
1 to 6 days	2.0	1.3	3.2
7 to 13 days	2.9	1.4	5.9
14 to 30 days (Frequent physical distress)	4.4	2.7	7.1
# DAYS IN THE PAST 30 DAYS MENTAL HEALTH NOT GOOD - Total			
None	1.0	1.0	1.0
1 to 6 days	1.1	0.7	1.8
7 to 13 days	3.3	1.5	6.9
14 to 30 days (Frequent mental distress)	4.5	2.7	7.2
# DAYS IN THE PAST 30 DAYS POOR HEALTH AFFECTED ACTIVITY - Total			
None	1.0	1.0	1.0
1 to 6 days	2.4	1.4	4.3
7 to 13 days	4.3	2.1	8.7
14 to 30 days	4.3	2.5	7.1
# DAYS IN THE PAST 30 DAYS DID NOT GET ENOUGH SLEEP - Total			
None	1.0	1.0	1.0
1 to 6 days	1.0	0.6	1.6
7 to 13 days	1.5	0.7	3.3
14 to 30 days	3.5	2.2	5.7
DEPRESSION BY SEVERITY SCALE (5 levels) - Total			
Severe depression (20<=s<25)	4.9	1.9	13.2
Moderately severe depression (15<=s<20)	10.1	4.4	23.3
Moderate depression (10<=s<15)	4.0	2.0	8.1
Mild depression (5<s<10)	2.9	1.8	4.8
No depression (<=4)	1.0	1.0	1.0
DEPRESSION BY SEVERITY SCALE (2 levels) - Total			
Current depression (10<=s<24)	3.9	2.3	6.6
No depression	1.0	1.0	1.0
PROVISIONAL DEPRESSIVE DISORDER - Total			
Current major depression	4.3	2.1	8.7
Current other depression	2.6	1.4	4.7
No depression	1.0	1.0	1.0
LIFETIME ANXIETY - Total			
Yes	3.6	2.3	5.6
No	1.0	1.0	1.0
LIFETIME DEPRESSION - Total			
Yes	3.7	2.4	5.7
No	1.0	1.0	1.0

Table 3. Continued

Adjusted Odds Ratios (AOR) for COPD by Selected Attributes

(Adjusted by age, gender, ethnic group, marital status, education and employment)	AOR	Lower 95% limit	Higher 95% limit
ASTHMA STATUS - Total			
Current asthma	10.3	7.0	15.1
Had asthma	2.5	1.0	6.4
Never had asthma	1.0	1.0	1.0
DIABETES - Total			
Have diabetes	1.7	1.1	2.7
No diabetes	1.0	1.0	1.0
HEART DISEASE - Total			
Had heart attack or angina heart disease, or stroke	2.9	1.7	4.9
None	1.0	1.0	1.0
CHRONIC DISEASE - Total			
Have been told that you have a chronic illness	6.8	4.6	10.0
No	1.0	1.0	1.0
DISABILITY - Total			
Disabled (with activity limitation or use special equipment)	2.6	1.7	3.8
No disability	1.0	1.0	1.0
BODY WEIGHT STATUS - Total			
Under weight (BMI <18.5)	2.6	1.0	6.7
Normal weight (18.5<=BMI<25)	1.0	1.0	1.0
Overweight but not obese (25<=BMI<30)	0.8	0.5	1.3
Obese (30<=BMI)	1.2	0.7	2.1
SMOKING STATUS - Total			
Current smoker	3.4	2.0	5.8
Former smoker	2.8	1.8	4.3
Never smoked	1.0	1.0	1.0

Table 3. Continued

Adjusted Odds Ratios (AOR) for COPD by Selected Attributes

(Adjusted by age, gender, ethnic group, marital status, education and employment)	AOR	Lower 95% limit	Higher 95% limit
EXERCISE - Total			
Had leisure time physical activity	1.0	1.0	1.0
None	1.5	0.9	2.3
HAVE ANY HEALTH CARE COVERAGE? - Total			
Yes	1.0	1.0	1.0
No	0.6	0.2	1.9
COULD'NT SEE DOCTOR WHEN NEEDED BECAUSE OF COST -Total			
At least once in the past 12 months	1.4	0.7	3.0
None	1.0	1.0	1.0
Total			
Always/usually	1.0	1.0	1.0
Sometimes	1.4	0.9	2.2
Rarely/Never	1.7	0.9	3.1
HOW SATISFIED ARE YOU WITH YOUR LIFE? - Total			
Satisfied to Very satisfied	1.0	1.0	1.0
Dissatisfied to Very dissatisfied	2.4	1.2	4.8

Hawai‘i Health Survey (HHS)

Table 4.

ADULT POPULATION[1] OF HAWAII (FROM RESPONDENT DATA)
HAWAII HEALTH SURVEY 2007

Has anyone in the household ever been told by a physician or medical professional that they have chronic obstructive pulmonary disease, also called COPD, emphysema or chronic bronchitis?

VARIABLE	HAS COPD	%	Lower 95% CL	Upper 95% CL	ADULT POPULATION
STATE	21,559	**2.2**	1.7	2.8	974,099
COUNTY					
Honolulu	14,312	**2.1**	1.5	2.9	682,878
Hawaii	2,035	**1.9**	1.2	2.9	107,758
Kauai	949	**1.7***	0.9	3.1	55,862
Maui	4,263	**3.3**	2.2	5.1	127,602
AGE					
18-34 Years	2,657	**1.1***	0.4	2.7	242,609
35-44 Years	1,874	**1.1***	0.5	2.6	171,414
45-54 Years	3515	**1.7**	1.0	3.0	204,645
55-64 Years	5,238	**3.0**	1.9	4.6	175,866
>64 Years	8,275	**4.6**	3.3	6.5	179,565
GENDER					
Male	11,172	**2.3**	1.6	3.4	476,752
Female	10,387	**2.1**	1.6	2.8	497,347
ETHNICITY					
White	8,821	**2.8**	2.1	3.9	310,744
Native Hawaiian/ Part	4,165	**2.6***	1.4	4.8	160,365
Chinese	1,870	**3.4***	1.3	8.4	55,235
Filipino	1,055	**0.8***	0.4	1.9	127,121
Japanese	3,834	**1.9***	1.0	3.5	198,605
Other	1,815	**1.6***	0.8	3.3	114,796
EDUCATION					
None-11th. Grade	1,665	**4.9***	2.4	9.8	33,939
HS Grad/ GED	6,375	**3.0**	1.9	4.6	213,809
College 1->4 Years	11,741	**1.9**	1.4	2.5	623,842
Unknown/ Less than 25 Years	**	**	**	**	102,509
MARITAL					
Married	8,835	**1.6**	1.2	2.3	539,680
Widowed/ Divorced/ Separated	6,996	**4.0**	2.8	5.7	174,380
Never Married	5,468	**2.4**	1.3	4.2	229,274
Unknown	**	**	**	**	30,765
INSURED					
Insured	20,124	**2.2**	1.7	2.8	903,736
Not Insured	1,435	**2.3***	0.9	5.6	61,439
Unknown	--	**--**	--	--	8,924
EMPLOYMENT					
Employed	7,882	**1.3**	0.8	2.0	607,774
Not Employed	1,925	**3.5***	1.5	8.0	54,882
Other	11,753	**3.8**	2.9	5.0	311,443
RETIRED					
Yes	9,156	**4.1**	2.9	5.6	225,777
No	12,404	**1.7**	1.2	2.3	748,322
UNABLE TO WORK					
Yes	1,987	**11.5***	5.8	21.7	17,278
No	19,573	**2.0**	1.6	2.6	956,821
POVERTY					
Below Poverty - Poor <100%	4,225	**5.8**	3.2	10.2	73,356
Near Poor 100-199%	4,576	**3.0**	1.8	4.8	152,597
Middle and High Income >199%	12,759	**1.7**	1.3	2.3	748,146

** Relative Standard Error >30% estimate statistically unreliable; ** Relative Standard Error >50% value suppressed*

-- No values sampled

[1] *Sample numbers provisionally weighted and adjusted for total population of Hawai`i*

(total numbers are adjusted as households without telephones, Ni`ihau, group quarters, and homeless are not represented, see HHS Procedure Manual 2003)

[2] *Row and/or column totals may not sum to totals listed due to rounding*

Sample size 110 with COPD, 4,009 Total respondents

Table 5.

ADULT POPULATION[1] OF HAWAII (FROM RESPONDENT DATA)
HAWAII HEALTH SURVEY 2007

Has anyone in the household ever been told by a physician or medical professional that they have chronic obstructive pulmonary disease, also called COPD, emphysema or chronic bronchitis?

VARIABLE	% COPD[3]	Lower 95% CL	Upper 95% CL
STATE	**2.0**	1.6	2.6
COUNTY			
Honolulu	**1.9**	1.4	2.7
Hawaii	**1.6**	1.0	2.5
Kauai	**1.4***	0.8	2.6
Maui	**3.2**	2.0	5.2
GENDER			
Male	**2.3**	1.6	3.4
Female	**1.8**	1.3	2.4
ETHNICITY			
White	**2.3**	1.6	3.2
Native Hawaiian/ Part	**2.6***	1.5	4.7
Chinese	**3.7***	1.4	9.6
Filipino	**0.9***	0.4	2.0
Japanese	**1.2***	0.7	2.2
Other	**2.2***	1.0	5.0
EDUCATION			
None-11th. Grade	**4.2***	2.0	8.5
HS Grad/ GED	**2.8**	1.7	4.6
College 1->4 Years	**1.6**	1.2	2.2
Unknown/ Less than 25 Years	**	35.0	37.5
MARITAL			
Married	**1.5**	1.0	2.1
Widowed/ Divorced/ Separated	**2.2**	1.5	3.3
Never Married	**2.9**	1.7	5.0
Unknown	**	0.1	4.6
INSURED			
Insured	**2.0**	1.5	2.6
Not Insured	**1.9***	0.7	4.9
Unknown	**--**	-	-
EMPLOYMENT			
Employed	**1.6**	0.9	2.8
Not Employed	**5.3***	1.8	14.4
Other	**2.7**	1.8	3.9
RETIRED			
Yes	**1.7**	1.1	2.6
No	**2.0**	1.3	3.2
UNABLE TO WORK			
Yes	**6.1***	2.9	12.7
No	**1.9**	1.4	2.5
POVERTY			
Below Poverty - Poor <100%	**5.3**	2.7	9.9
Near Poor 100-199%	**2.7**	1.7	4.4
Middle and High Income >199%	**1.6**	1.2	2.2

** Relative Standard Error >30% estimate statistically unreliable; ** Relative Standard Error >50% value suppressed*

-- No values sampled

[1] *Sample numbers provisionally weighted and adjusted for total population of Hawai`i (total numbers are adjusted as households without telephones, Ni`ihau, group quarters, and homeless are not represented, see HHS Procedure Manual 2003)*

[2] *Row and/or column totals may not sum to totals listed due to rounding*

[3] *Values age adjusted to the 2000 Census population of the US*

Sample size 110 with COPD, 4,009 Total respondents

Table 6.

ADULT POPULATION[1] OF HAWAII (FROM RESPONDENT DATA) HAWAII HEALTH SURVEY 2007

Has anyone in the household ever been told by a physician or medical professional that they have chronic obstructive pulmonary disease, also called COPD, emphysema or chronic bronchitis?

VARIABLE	HAS COPD	% COPD	Lower 95% CL	Upper 95% CL	ADULT POPULATION
ARTHRITIS					
Yes	9,938	**6.6**	4.8	9.1	149,674
No	11,622	**1.4**	1.0	2.0	824,425
ASTHMA					
Yes	10,676	**10.7**	7.6	14.8	99,993
No	10,883	**1.2**	0.9	1.7	874,106
DIABETES					
Yes	3,907	**3.9**	2.3	6.3	101,028
No	17,653	**2.0**	1.5	2.6	873,071
TYPE OF DIABETES					
Type 2 Adult Onset	3,580	**5.2**	3.1	8.6	68,934
HBP					
Yes	9,321	**3.7**	2.7	5.2	249,350
No	12,239	**1.7**	1.2	2.3	724,749
HBC					
Yes	9,859	**3.9**	2.9	5.4	251,138
No	11,701	**1.6**	1.1	2.3	722,961
WEIGHT					
Underweight	1,142	**4.1***	1.7	9.3	28,143
Normal	7,099	**1.8**	1.2	2.6	403,528
Overweight	5,950	**1.8**	1.2	2.8	323,602
Obese I	2,541	**2.1***	1.0	4.5	121,392
Obese II	2,733	**6.3***	2.8	13.5	43,570
Obese III	2,094	**6.9***	3.6	13.1	30,235

** Relative Standard Error >30% estimate statistically unreliable; ** Relative Standard Error >50% value suppressed*

-- No values sampled

[1] *Sample numbers provisionally weighted and adjusted for total population of Hawai`i (total numbers are adjusted as households without telephones, Ni`ihau, group quarters, and homeless are not represented, see HHS Procedure Manual 2003)*

[2] *Row and/or column totals may not sum to totals listed due to rounding*

Sample size 110 with COPD, 4,009 Total respondents

Table 7.

ADULT POPULATION[1] OF HAWAII (FROM RESPONDENT DATA)
HAWAII HEALTH SURVEY 2007

Has anyone in the household ever been told by a physician or medical professional that they have chronic obstructive pulmonary disease, also called COPD, emphysema or chronic bronchitis?

VARIABLE	% COPD	Lower 95% CL	Upper 95% CL
ARTHRITIS			
Yes	**4.6**	3.0	6.9
No	**1.5**	1.1	2.1
ASTHMA			
Yes	**10.5**	7.5	14.3
No	**1.2**	0.8	1.6
DIABETES			
Yes	**2.9**	1.6	5.3
No	**1.9**	1.5	2.6
TYPE OF DIABETES			
Type 2 Adult Onset	**4.7**	2.1	10.1
HBP			
Yes	**3.0**	1.6	5.5
No	**1.8**	1.3	2.4
HBC			
Yes	**2.4**	1.7	3.4
No	**1.7**	1.2	2.4
WEIGHT			
Underweight	**2.4***	1.1	5.5
Normal	**1.5**	1.0	2.3
Overweight	**1.8**	1.1	2.8
Obese I	**1.9**	0.8	4.3
Obese II	**6.7**	2.8	15.1
Obese III	**9.2**	5.3	15.3

** Relative Standard Error >30% estimate statistically unreliable; ** Relative Standard Error >50% value suppressed*

-- No values sampled

[1] *Sample numbers provisionally weighted and adjusted for total population of Hawai`i (total numbers are adjusted as households without telephones, Ni`ihau, group quarters, and homeless are not represented, see HHS Procedure Manual 2003)*

[2] *Row and/or column totals may not sum to totals listed due to rounding*

[3] *Values age adjusted to the 2000 Census population of the US*

Sample size 110 with COPD, 4,009 Total respondents

Table 8.

ADULT POPULATION[1] OF HAWAII (FROM RESPONDENT DATA) HAWAII HEALTH SURVEY 2007

SF12 QUALITY OF LIFE QUESTION	TOTAL[2]				YES				NO			
	N	%	LOW 95%	UP 95%	N	%	LOW 95%	UP 95%	N	%	LOW 95%	UP 95%
TOTAL	974,099				21,559				952,540	100		
TYPICAL DAY, HEALTH LIMITED FROM MODERATE ACTIVITIES, SUCH AS MOVING A TABLE, PUSHING A VACUUM CLEANER, BOWLING, OR PLAYING GOLF.												
YES, LIMITED	147,378	15.1	13.8	16.5	9,521	**44.2**	33.2	55.8	137,858	14.5	13.2	15.9
NOT LIMITED	825,652	84.8	83.4	86.1	11,650	**54.0**	42.3	65.3	814,002	85.5	84.1	86.8
TYPICAL DAY, HEALTH LIMITED FROM MODERATE ACTIVITIES, SUCH AS CLIMBING SEVERAL FLIGHTS OF STAIRS.												
YES, LIMITED	148,400	15.2	13.9	16.6	11,345	**52.6**	40.7	64.2	137,055	14.4	13.1	15.8
NOT LIMITED	823,287	84.5	83.1	85.8	10,214	**47.4**	35.8	59.3	813,072	85.4	84.0	86.7
PAST FOUR WEEKS, PHYSICAL HEALTH LIMIT ACCOMPLISH LESS THAN YOU WOULD LIKE?												
ALL, MOST	113,447	11.6	10.4	12.9	7,154	**33.2**	23.3	44.9	106,293	11.2	10.0	12.5
SOME, LITTLE	210,817	21.6	20.1	23.2	9,213	**42.7**	31.4	54.9	201,603	21.2	19.6	22.8
NONE OF THE TIME	644,182	66.1	64.2	67.9	5,148	**23.9**	15.5	34.9	639,035	67.1	65.2	68.9
PAST FOUR WEEKS, PHYSICAL HEALTH LIMIT LIMITED IN THE KIND OF WORK OR OTHER ACTIVITIES YOU CAN DO?												
ALL, MOST	62,828	6.4	5.5	7.4	5,859	**27.2**	18.2	38.6	56,968	6.0	5.2	7.0
SOME, LITTLE	166,438	17.1	15.7	18.6	8,769	**40.7**	29.6	52.8	157,669	16.6	15.2	18.1
NONE OF THE TIME	741,852	76.2	74.5	77.8	6,931	**32.1**	22.1	44.1	734,921	77.2	75.5	78.8
PAST FOUR WEEKS, EMOTIONAL PROBLEMS - ACCOMPLISH LESS THAN YOU WOULD LIKE?												
ALL, MOST	37,768	3.9	3.3	4.7	3,448	**16.0**	9.1	26.6	34,320	3.6	3.0	4.3
SOME, LITTLE	156,078	16.0	14.6	17.5	4,815	**22.3**	14.2	33.3	151,264	15.9	14.5	17.4
NONE OF THE TIME	775,626	79.6	78.0	81.1	13,251	**61.5**	49.6	72.1	762,374	80.0	78.4	81.5
PAST FOUR WEEKS, EMOTIONAL PROBLEMS - DIDN'T DO WORK OR OTHER ACTIVITIES AS CAREFULLY AS USUAL.												
ALL, MOST	39,349	4.0	3.3	4.8	2,910	**13.5**	7.5	23.2	36,439	3.8	3.1	4.6
SOME, LITTLE	146,740	15.1	13.8	16.6	4,840	**22.4**	14.3	33.3	141,900	14.9	13.5	16.4
NONE OF THE TIME	781,627	80.2	78.6	81.7	13,336	**61.9**	50.2	72.4	768,291	80.7	79.1	82.2
PAST FOUR WEEKS, PAIN INTERFERED WITH NORMAL WORK?												
EXTREMELY/QUITE A BIT	61,535	6.3	5.5	7.2	4,994	**23.2**	15.3	33.5	56,541	5.9	5.1	6.8
MODERATELY/A LITTLE BIT	251,498	25.8	24.1	27.5	8,676	**40.2**	28.9	52.6	242,822	25.5	23.8	27.2
NOT AT ALL	660,346	67.8	66.0	69.6	7,670	**35.6**	25.3	47.4	652,676	68.5	66.7	70.3
PAST FOUR WEEKS, HAVE YOU FELT CALM AND PEACEFUL?												
NONE OF THE TIME	24,760	2.5	1.9	3.2	679	**	0.7	12.4	24,081	2.5	1.9	3.2
SOME, LITTLE	227,884	23.4	21.8	25.1	8,457	**39.2**	28.5	51.1	219,426	23.0	21.3	24.7
ALL, MOST	718,561	73.8	72.0	75.5	12,423	**57.6**	45.7	68.7	706,137	74.1	72.3	75.8
PAST FOUR WEEKS, DID YOU HAVE A LOT OF ENERGY?												
NONE OF THE TIME	26,354	2.7	2.2	3.4	909	**4.2***	1.7	9.8	25,446	2.7	2.2	3.4
SOME, LITTLE	278,137	28.6	26.9	30.4	11,581	**53.7**	41.8	65.2	266,556	28.0	26.2	29.8
ALL, MOST	668,168	68.6	66.7	70.4	9,070	**42.1**	30.8	54.3	659,099	69.2	67.3	71.0
PAST FOUR WEEKS, HAVE YOU FELT DOWN-HEARTED AND BLUE?												
ALL, MOST	30,942	3.2	2.6	3.9	1,321	**6.1***	2.5	13.9	29,621	3.1	2.5	3.8
SOME, LITTLE	285,614	29.3	27.5	31.1	7,946	**36.9**	26.6	48.6	277,668	29.2	27.4	31.1
NONE OF THE TIME	656,292	67.4	65.5	69.2	12,073	**56.0**	44.3	67.1	644,218	67.6	65.7	69.4
PAST FOUR WEEKS, PHYSICAL HEALTH OR EMOTIONAL PROBLEMS INTERFERED WITH YOUR SOCIAL ACTIVITIES.												
ALL, MOST	44,739	4.6	3.9	5.4	2,895	**13.4**	7.4	23.1	41,844	4.4	3.7	5.2
SOME, LITTLE	154,112	15.8	14.4	17.3	4,508	**20.9**	13.5	30.9	149,604	15.7	14.3	17.2
NONE OF THE TIME	772,210	79.3	77.7	80.8	13,892	**64.4**	53.0	74.4	758,318	79.6	78.0	81.1

** Relative Standard Error >30% estimate statistically unreliable; ** Relative Standard Error >50% value suppressed*

-- No values sampled

[1] *Sample numbers provisionally weighted and adjusted for total population of Hawai`i*
(total numbers are adjusted as households without telephones, Ni`ihau, group quarters, and homeless are not represented, see HHS Procedure Manual 2003)

[2] *Row and/or column totals may not sum to totals listed due to rounding*

Sample size 110 with COPD, 4,009 Total respondents

Table 9.

ADULT POPULATION[1] OF HAWAII (FROM RESPONDENT DATA) HAWAII HEALTH SURVEY 2007				
What conditions have you been told you have?				
COPD CONDITION	YES COPD			
	N[2]	%	Lower 95% Limit	Upper 95% Limit
	21,559			
EMPHYSEMA	5,066	23.5*	14.9	35.0
COPD	6,597	30.6	21.4	41.7
BRONCHITIS	11,297	52.4	40.6	63.9
COPD OTHER	2,716	12.6*	6.7	22.3
UNKNOWN	**	**	**	**

** Relative Standard Error >30% estimate statistically unreliable; ** Relative Standard Error >50% value suppressed*

[1] Sample numbers provisionally weighted and adjusted for total population of Hawai`i

(total numbers are adjusted as households without telephones, Ni`ihau, group quarters, and homeless are not represented, see HHS Procedure Manual 2003)

[2] Row and/or column totals may not sum to totals listed due to rounding

Sample size 110 with COPD, 4,009 Total respondents

Table 9. Continued

ADULT POPULATION[1] OF HAWAII (FROM RESPONDENT DATA) HAWAII HEALTH SURVEY 2007				
What conditions have you been told you have? (Age Adjusted)				
COPD CONDITION	YES COPD			
	N[2]	3%	Lower 95% Limit	Upper 95% Limit
	21,559			
EMPHYSEMA	4,032	18.7*	8.2	37.4
COPD	4,118	19.1	13.7	25.9
BRONCHITIS	13,129	60.9	43.2	76.1
COPD OTHER	2,177	10.1*	4.9	19.4
UNKNOWN	**	**	**	**

** Relative Standard Error >30% estimate statistically unreliable; ** Relative Standard Error >50% value suppressed*

[1] Sample numbers provisionally weighted and adjusted for total population of Hawai`i

(total numbers are adjusted as households without telephones, Ni`ihau, group quarters, and homeless are not represented, see HHS Procedure Manual 2003)

[2] Row and/or column totals may not sum to totals listed due to rounding

[3] Values age adjusted to the 2000 Census population of the US

Sample size 110 with COPD, 4,009 Total respondents

Table 10.

ADULT POPULATION[1] OF HAWAII (FROM RESPONDENT DATA) HAWAII HEALTH SURVEY 2007			
ODDS RATIOS FOR COPD			
VARIABLES	ODDS VALUES AND REFERENCE		
	Odds Ratio	Lower 95% OD Limit	Upper 95% Limit
AGE			
18-34 Years	1.00	1.00	1.00
35-44 Years	7.84	0.84	73.32
45-54 Years	**14.96***	1.92	116.61
55-64 Years	**19.58***	2.58	148.53
>64 Years	**29.02***	3.82	220.47
GENDER			
Male	1.28	0.76	2.16
Female	1.00	1.00	1.00
MARRIAGE			
Married	1.00	1.00	1.00
Not Married	1.48	0.83	2.61
POVERTY			
Below Poverty -Near Poor <199%	**2.35***	1.31	4.24
Middle and High Income >199%	1.00	1.00	1.00
EDUCATION			
High School Grad/GED or Less	1.00	1.00	1.00
College 1-4+ Years	1.15	0.63	2.11
COPD HEALTH CONDITIONS ADJUSTED FOR ABOVE VARIABLES	ODDS VALUES AND REFERENCE		
	Odds Ratio	Lower 95% OD Limit	Upper 95% Limit
ASTHMA			
Yes	**10.47***	6.02	18.21
No	1.00	1.00	1.00
OVERWEIGHT OR OBESE			
Yes	1.20	0.70	2.05
No	1.00	1.00	1.00
DIABETES			
Yes	1.34	0.68	2.64
No	1.00	1.00	1.00
HBP			
Yes	1.65	0.97	2.82
No	1.00	1.00	1.00
HBC			
Yes	**1.91***	1.10	3.30
No	1.00	1.00	1.00

[1] Sample numbers provisionally weighted and adjusted for total population of Hawai`i
** Significant at alpha = 0.05*
Link Function: Logit
Variances computed using the Taylor Linearization Method

Table 11.

Adult Prevalence of Chronic Health Conditions by COPD Status, HHS 2007*			
Chronic Condition	**%**	**Lower 95% CL**	**Upper 95% CL**
ARTHRITIS: Yes			
State Adults	**13.4**	12.3	14.5
Has COPD	**31.0**	23.3	40.1
No Copd	**13.0**	11.9	14.1
ASTHMA: Yes			
State Adults	**10.2**	8.9	11.6
Has COPD	**44.2**	28.7	60.9
No Copd	**9.4**	8.1	10.8
DIABETES: Yes			
State Adults	**9.2**	8.2	10.3
Has COPD	**13.1**	7.9	20.8
No Copd	**9.1**	8.1	10.2
HBP: Yes			
State Adults	**22.9**	21.4	24.4
Has COPD	**32.7**	21.4	46.4
No Copd	**22.7**	21.2	24.2
HBC: Yes			
State Adults	**22.5**	21.1	23.9
Has COPD	**33.2**	26.9	40.1
No Copd	**22.2**	20.9	23.7

* age adjusted to Census 2000

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For more information, please contact the Chronic Disease Management and Control Branch at (808) 586-4609

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