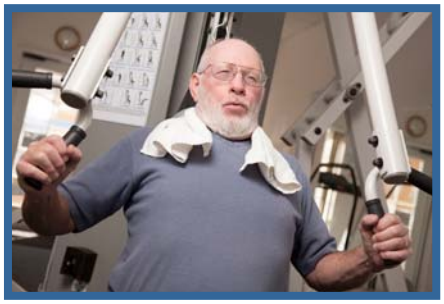

Critical Pathways:

the Disease Continuum

Introduction

The Critical Pathways to Disease are tools to be used in health promotion and disease prevention efforts by public health professionals. This packet contains information on those diseases which have significant impacts on the health of the San Diego County population. The purpose of the Critical Pathways are to identify populations at greater risk for various diseases and to identify prevention and early intervention opportunities. These pathways are adapted from those created through a collaboration with 2004 CHIP Needs Assessment Committee.

See original CHIP Critical Pathways.

The pathways at the top of each page display major risk factors, intermediate outcomes or comorbidities, and the indicated disease. Below each pathway is a data grid describing the San Diego resident population in relation to selected elements of the pathway. The data represent all San Diegans, and not only those with a particular disease. The left axis (bar) indicates the percent of the population with a particular characteristic that is a known risk factor or intermediate outcome. The right axis (diamond) indicates the rate of specified medical encounter per specified population.

The data grids are designed to be used as a tool to assist in quick identification of opportunities for interventions that might have a high impact on a particular disease. Risk factors are marked as nonmodifiable (black striped bars) such as race/ethnicity or gender and modifiable (solid colored bars) such as physical activity or high blood pressure. The data grids also display the patterns of medical encounter in the form of rates of Emergency Department Discharge, Hospital Discharge, and Death. Reviewing these patterns can illustrate where people may be encountering the medical system for a disease, or compared with other diseases to see how the patterns vary (e.g. stroke vs. asthma). Please see the indicator definitions section for further explanation.

The Community Health Statistics Unit website, www.SDHealthStatistics.com, has considerable information available. The website provides detailed demographic, health and facility data including maps of geographically formatted health data. Also available are links to other county data sources, state and national sites of interest. For further assistance with data or interpretation, please contact the Community Health Statistics Unit.

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Julie.Cooke@sdcounty.ca.gov
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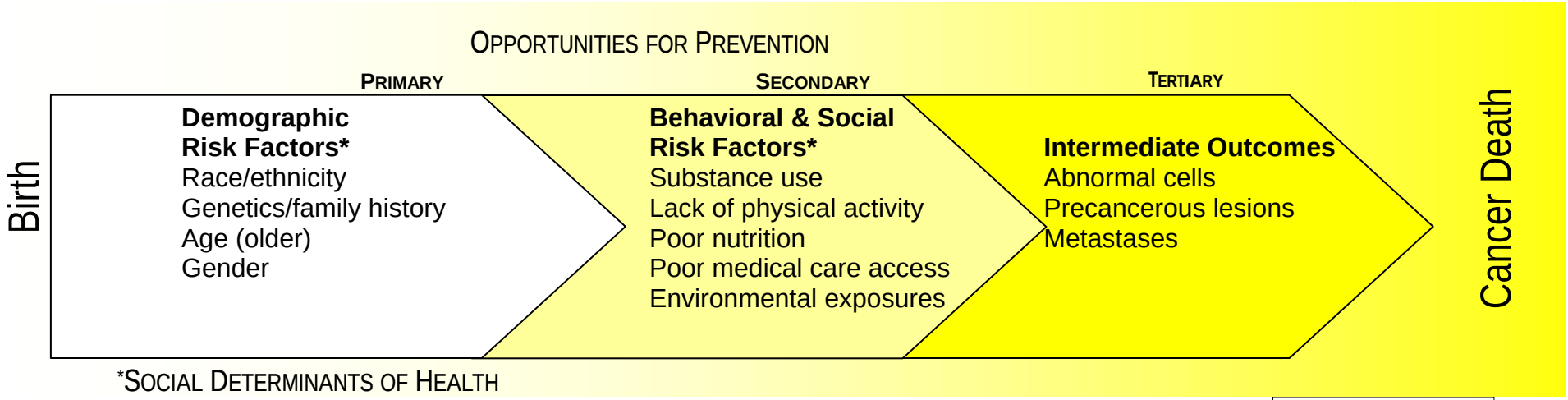
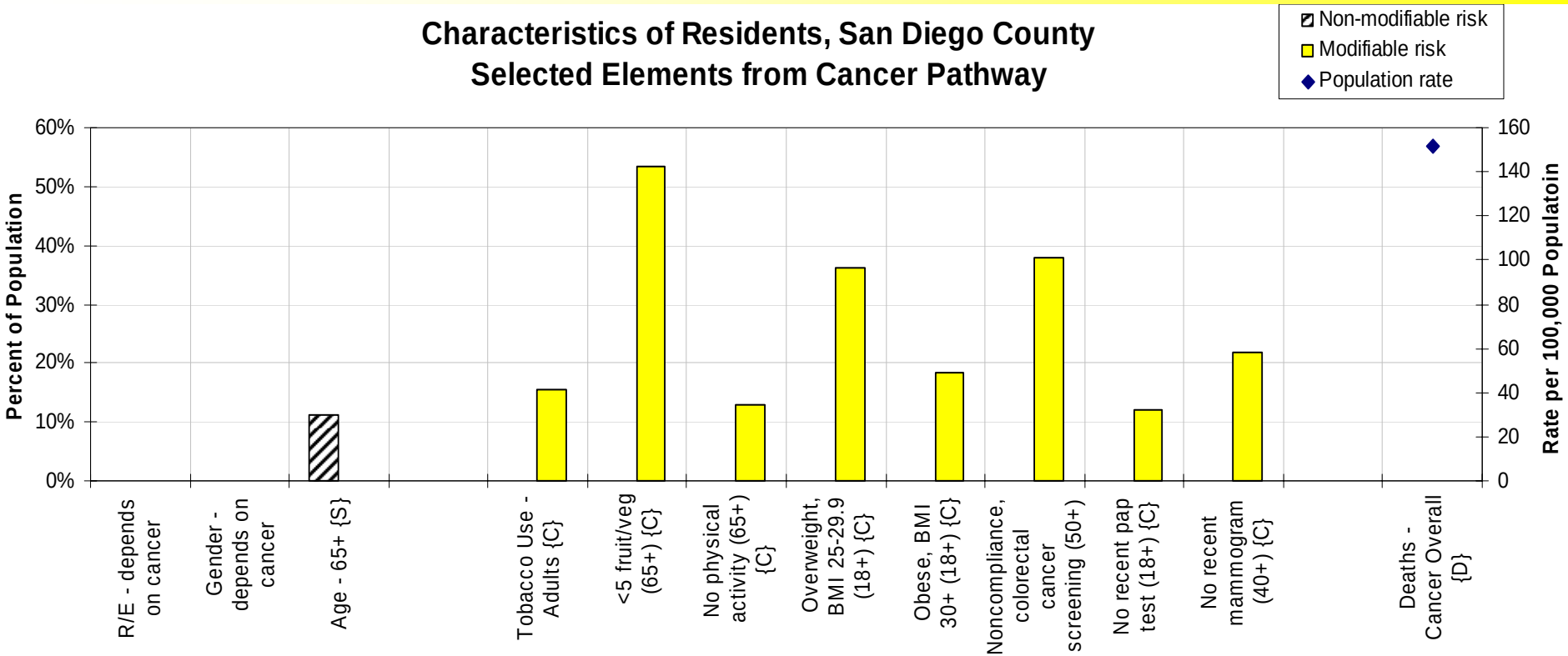
Table of Contents

Cancer


OPPORTUNITIES FOR PREVENTION
PRIMARY
SECONDARY
TERTIARY
Birth
Demographic Risk Factors*
Race/ethnicity
Genetics/family history
Age (older)
Gender
Behavioral & Social Risk Factors*
Substance use
Lack of physical activity
Poor nutrition
Poor medical care access
Environmental exposures
Intermediate Outcomes
Abnormal cells
Precancerous lesions
Metastases
Cancer Death
*SOCIAL DETERMINANTS OF HEALTH


Characteristics of Residents, San Diego County
Selected Elements from Cancer Pathway
Non-modifiable risk
Modifiable risk
Population rate
Percent of Population
Rate per 100,000 Populatoin
60%
50%
40%
30%
20%
10%
0%
160
140
120
100
80
60
40
20
0
R/E - depends on cancer
Gender - depends on cancer
Age - 65+ {S}
Tobacco Use - Adults {C}
<5 fruit/veg (65+) {C}
No physical activity (65+) {C}
Overweight, BMI 25-29.9 (18+) {C}
Obese, BMI 30+ (18+) {C}
Noncompliance, colorectal cancer screening (50+)
No recent pap test (18+) {C}
No recent mammogram (40+) {C}
Deaths - Cancer Overall {D}

Coronary Heart Disease

Opportunities for Prevention

Birth

Primary

Demographic Risk Factors*
Race/ethnicity
Genetics/family history
Age (older)
Gender
Socioeconomic status

Secondary

Behavioral & Social Risk Factors*
Tobacco use
Alcohol abuse
Lack of physical activity
Poor nutrition
Poor medical care
Stress, depression

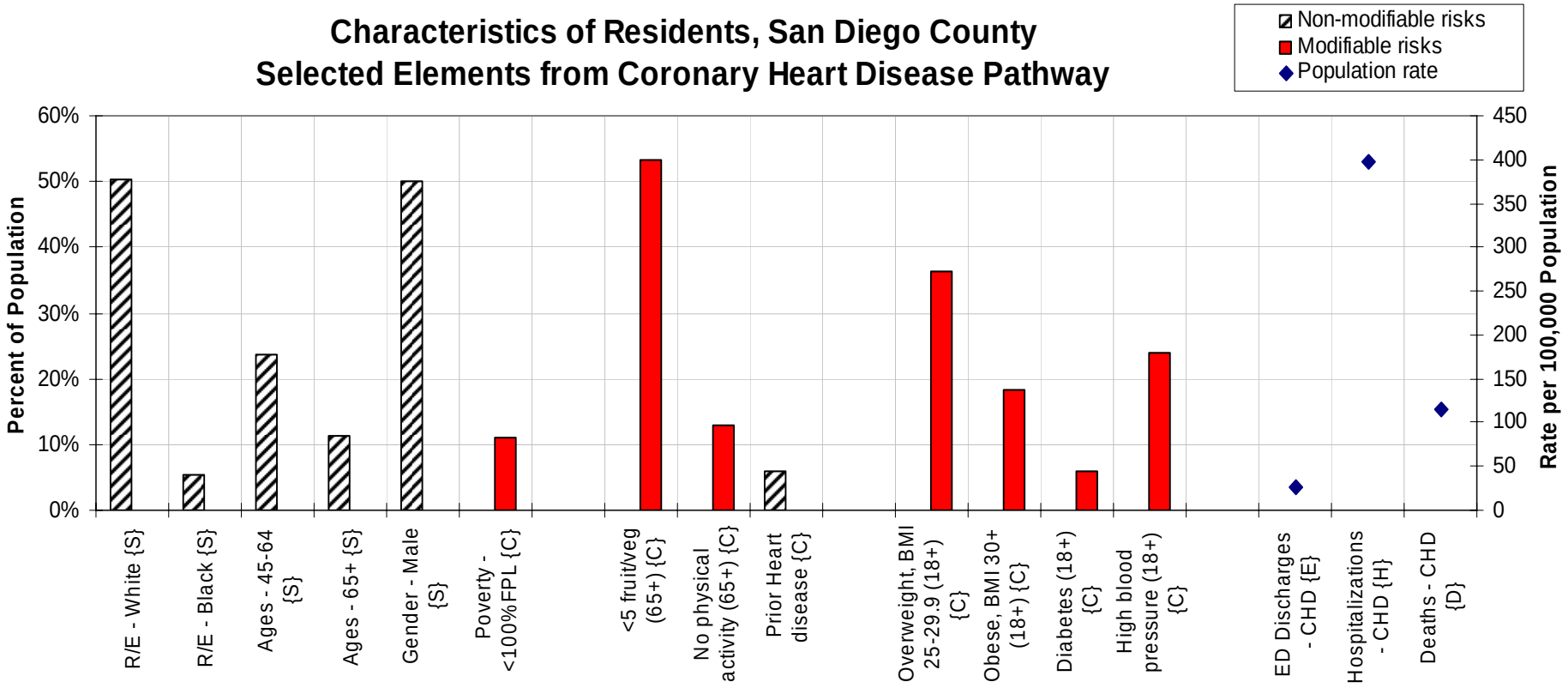
Tertiary

Intermediate Outcomes
High blood pressure
High cholesterol
Chest pain
Diabetes
Obesity

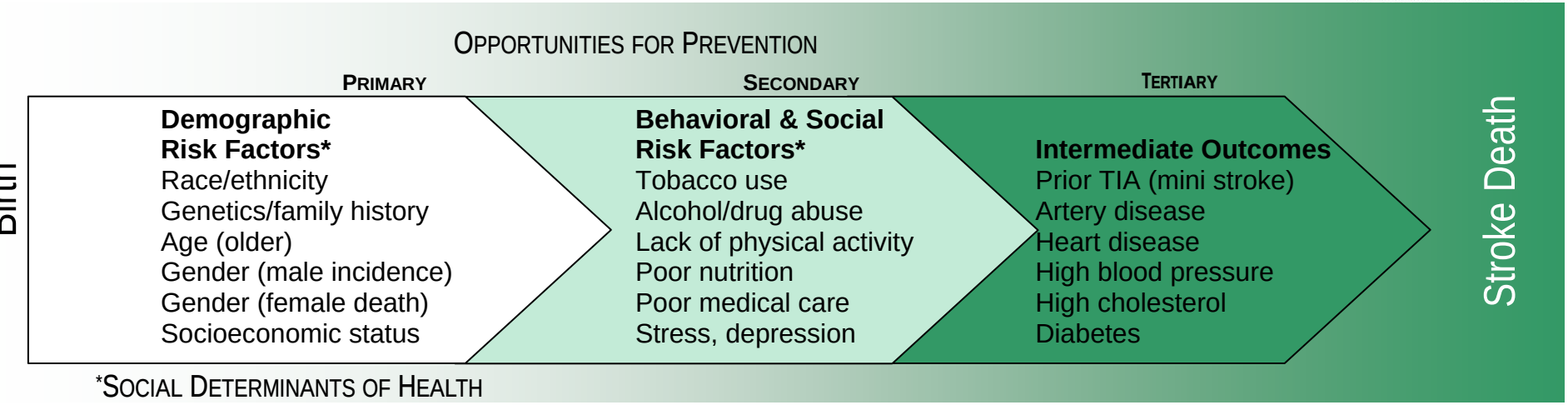
Coronary Heart Disease Death

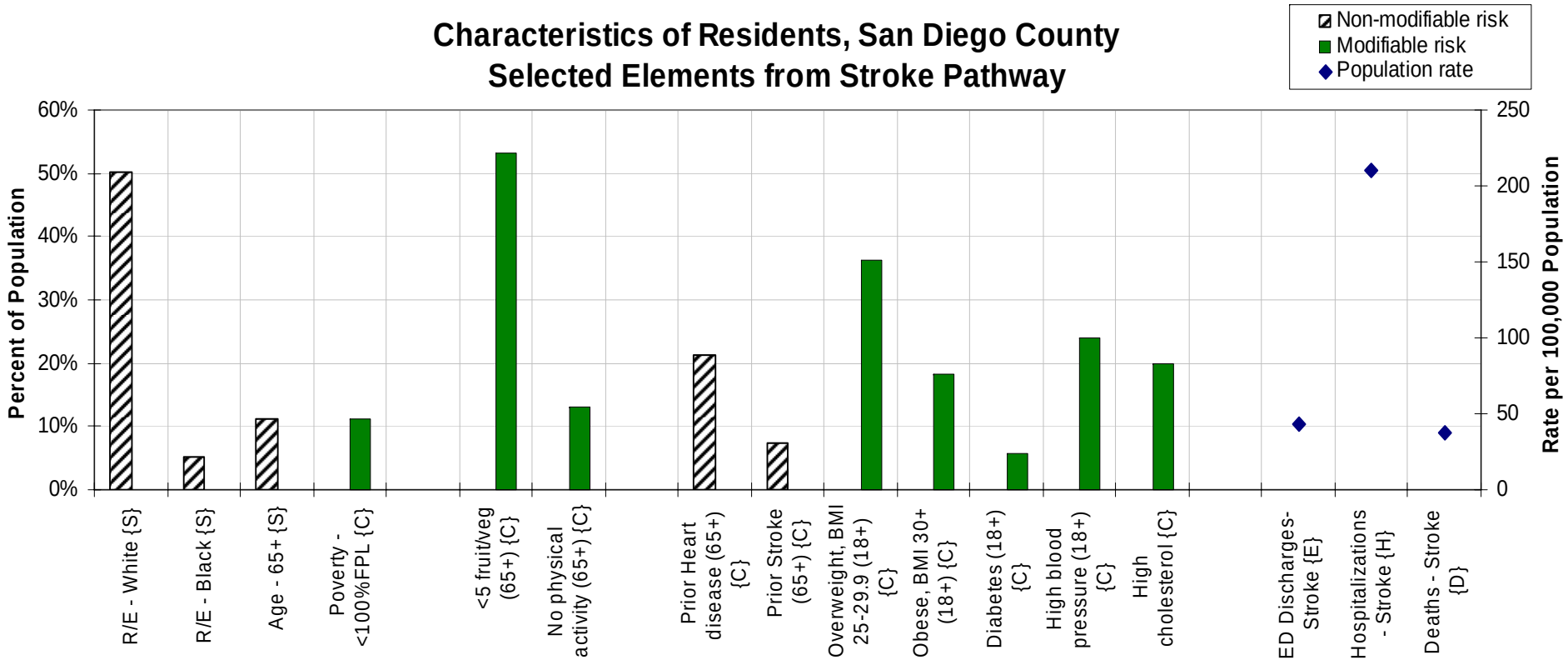
*Social Determinants of Health

Characteristics of Residents, San Diego County
Selected Elements from Coronary Heart Disease Pathway



Stroke


OPPORTUNITIES FOR PREVENTION
PRIMARY
SECONDARY
TERTIARY
Birth
Demographic Risk Factors*
Race/ethnicity
Genetics/family history
Age (older)
Gender (male incidence)
Gender (female death)
Socioeconomic status
Behavioral & Social Risk Factors*
Tobacco use
Alcohol/drug abuse
Lack of physical activity
Poor nutrition
Poor medical care
Stress, depression
Intermediate Outcomes
Prior TIA (mini stroke)
Artery disease
Heart disease
High blood pressure
High cholesterol
Diabetes
Stroke Death
*SOCIAL DETERMINANTS OF HEALTH


Characteristics of Residents, San Diego County
Selected Elements from Stroke Pathway
Non-modifiable risk
Modifiable risk
Population rate
Percent of Population
Rate per 100,000 Population
60%
50%
40%
30%
20%
10%
0%
250
200
150
100
50
0
R/E - White {S}
R/E - Black {S}
Age - 65+ {S}
Poverty - <100%FPL {C}
<5 fruit/veg (65+) {C}
No physical activity (65+) {C}
Prior Heart disease (65+) {C}
Prior Stroke (65+) {C}
Overweight, BMI 25-29.9 (18+) {C}
Obese, BMI 30+ (18+) {C}
Diabetes (18+) {C}
High blood pressure (18+) {C}
High cholesterol {C}
ED Discharges-Stroke {E}
Hospitalizations - Stroke {H}
Deaths - Stroke {D}

Diabetes

Opportunities for Prevention

Birth → Diabetes Death

Primary

Demographic Risk Factors*
- Race/ethnicity
- Genetics/family history
- Age (older)
- Socioeconomic status

Secondary

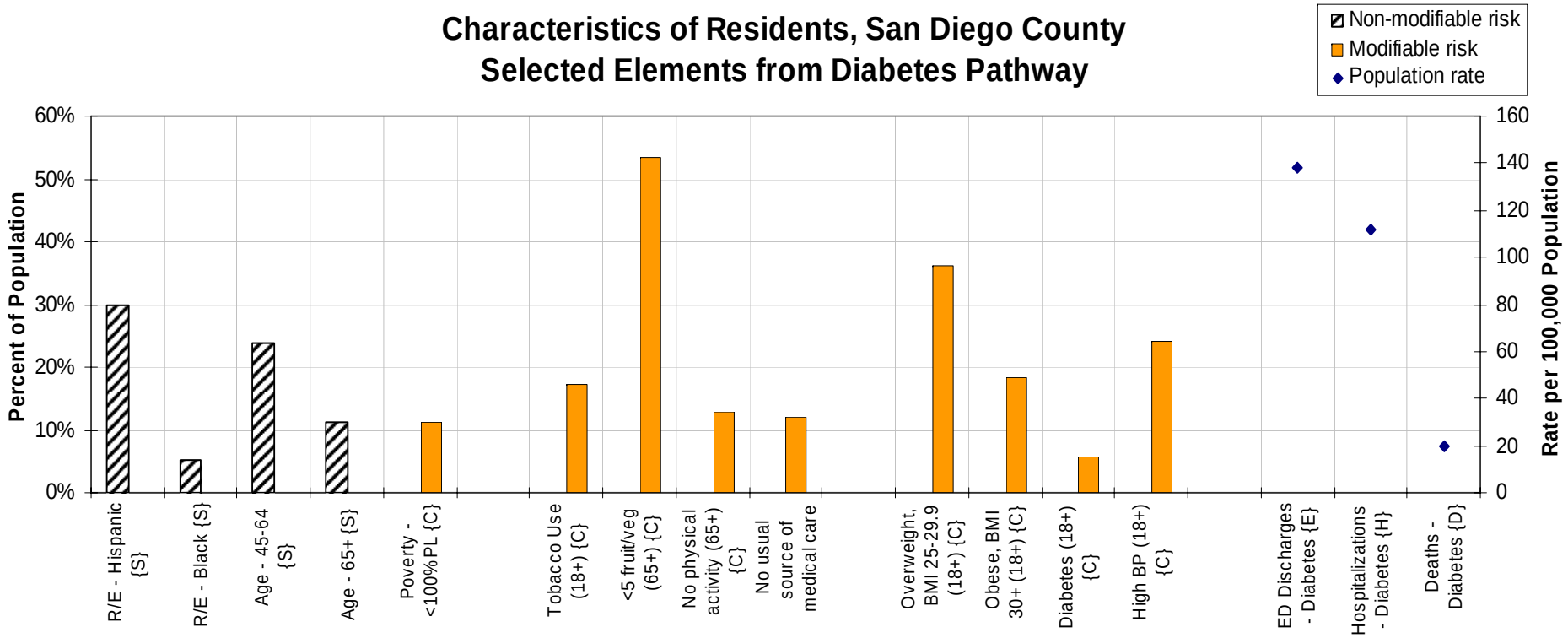
Behavioral & Social Risk Factors*
- Substance use
- Lack of physical activity
- Poor nutrition
- Poor medical care
- Irregular health checks (eg. A1C, foot, dental, eye)

Tertiary

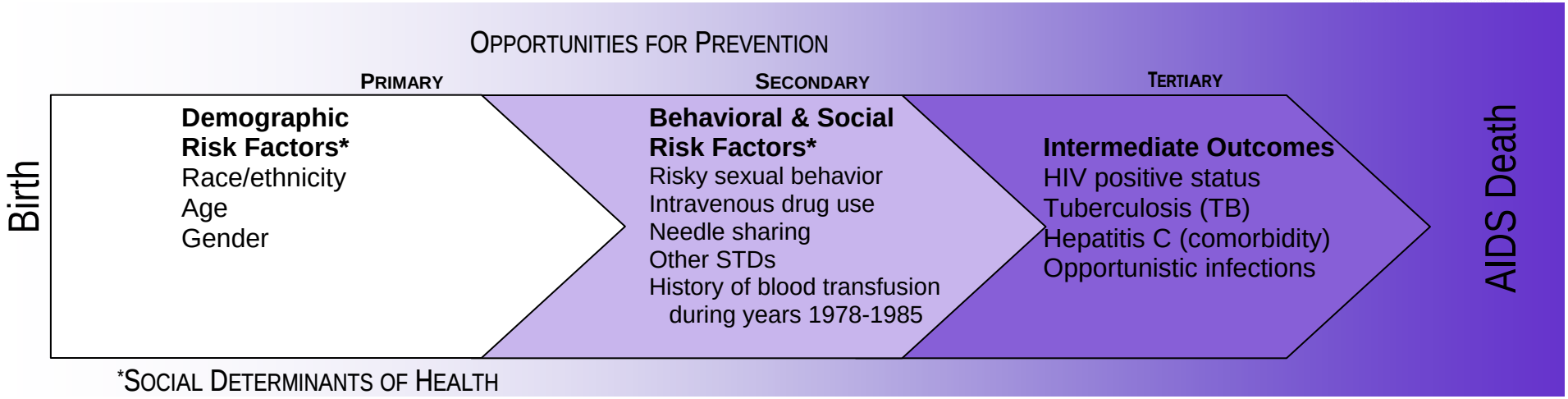
Intermediate Outcomes
- Prior TIA (mini stroke)
- Kidney disease
- Cardiovascular disease
- Eye disease
- Amputation/Neuropathies
- Obesity

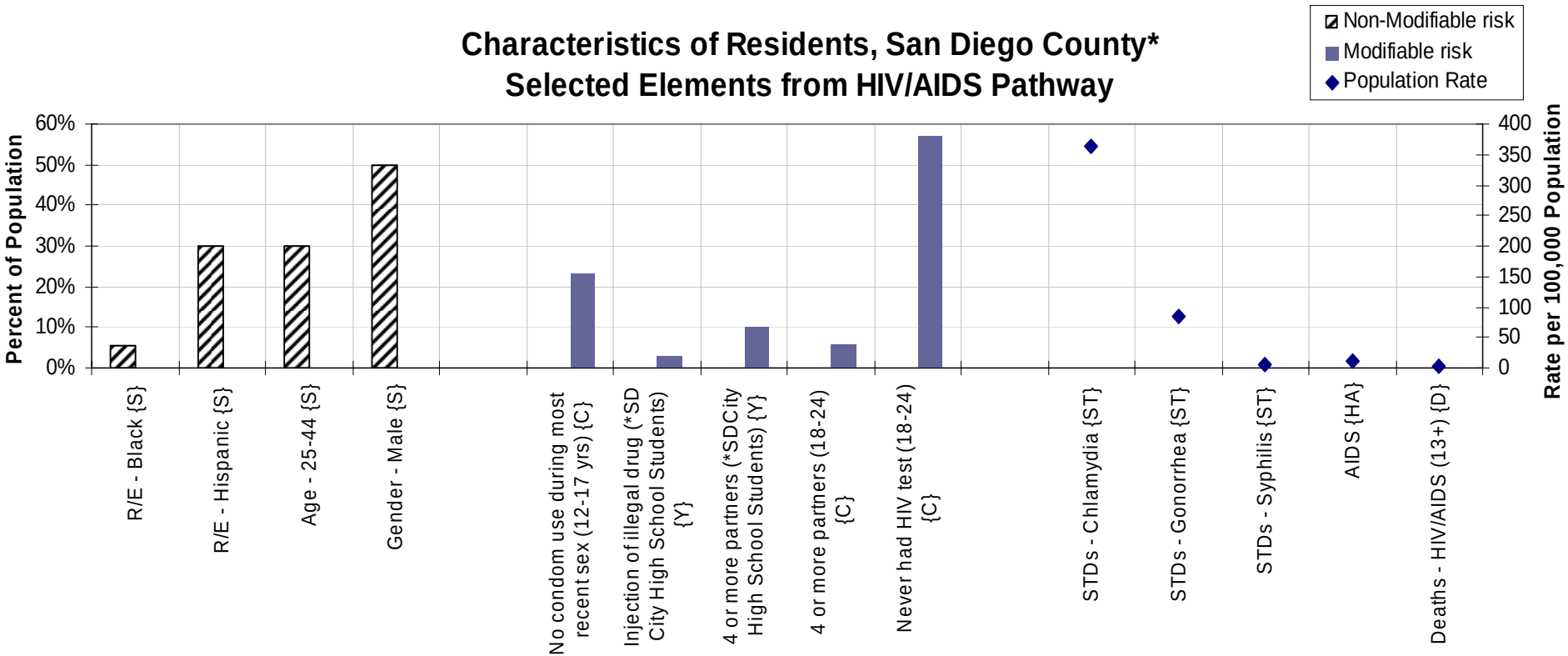
*Social Determinants of Health

Characteristics of Residents, San Diego County
Selected Elements from Diabetes Pathway

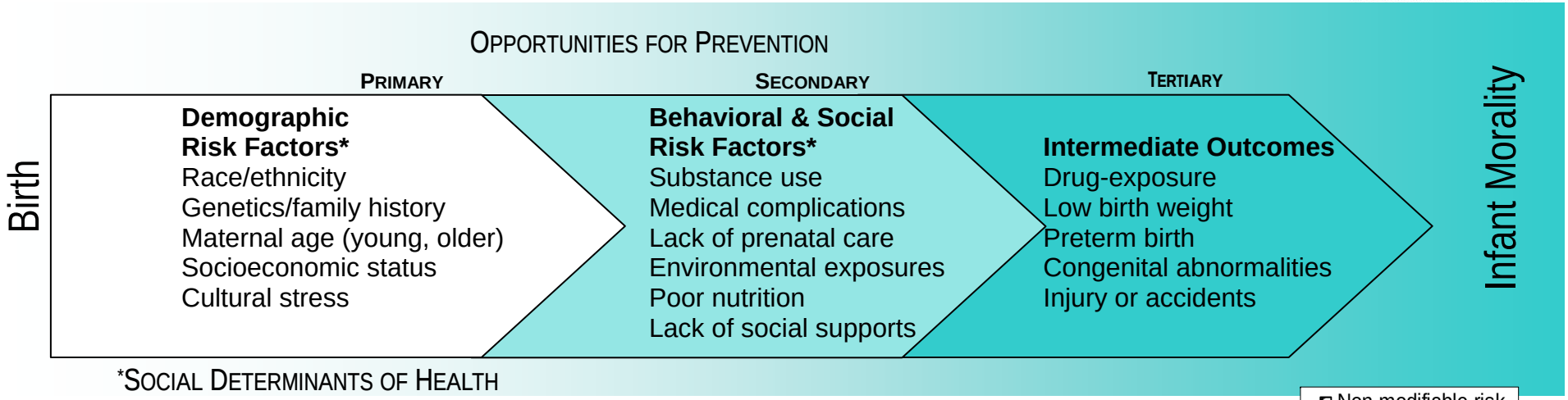


HIV/AIDS

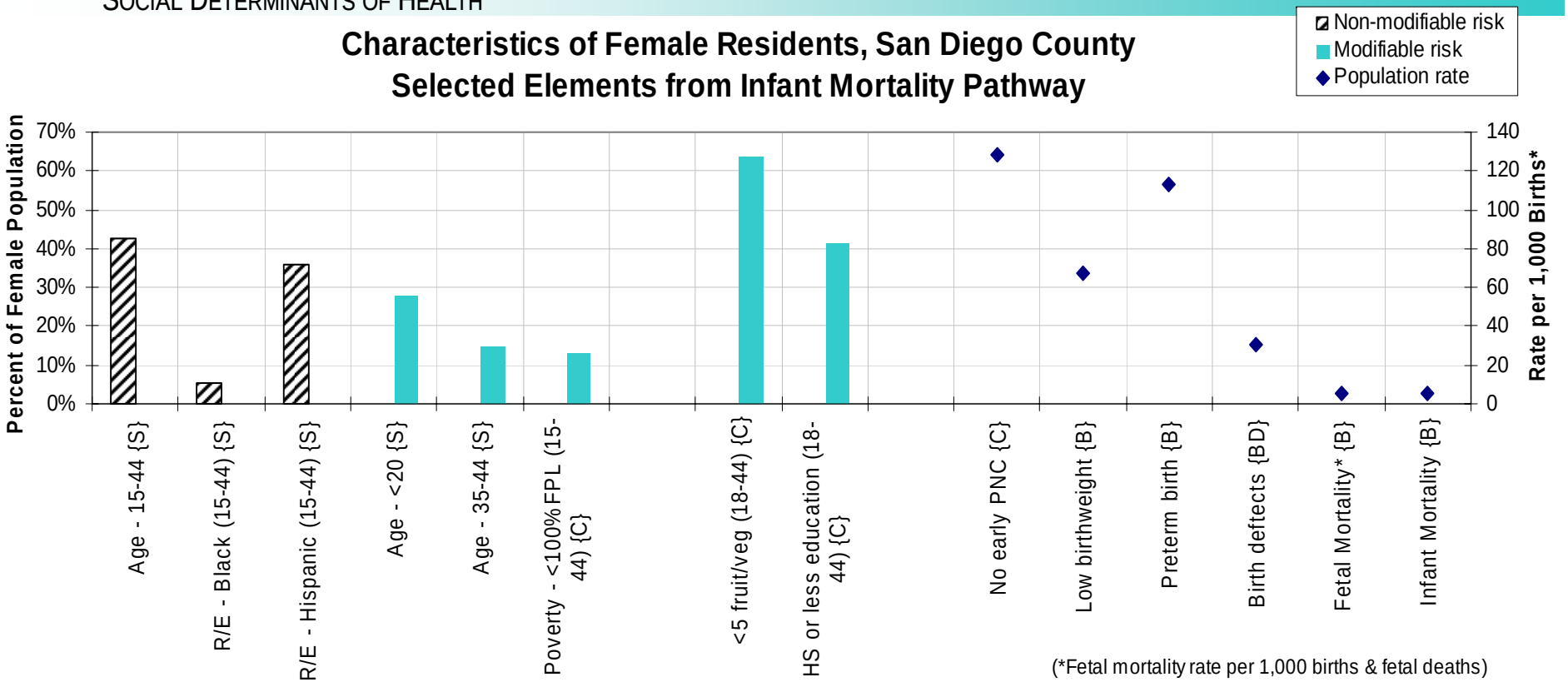

OPPORTUNITIES FOR PREVENTION
PRIMARY
SECONDARY
TERTIARY
Birth
Demographic Risk Factors*
Race/ethnicity
Age
Gender
Behavioral & Social Risk Factors*
Risky sexual behavior
Intravenous drug use
Needle sharing
Other STDs
History of blood transfusion during years 1978-1985
Intermediate Outcomes
HIV positive status
Tuberculosis (TB)
Hepatitis C (comorbidity)
Opportunistic infections
AIDS Death
*SOCIAL DETERMINANTS OF HEALTH


Characteristics of Residents, San Diego County*
Selected Elements from HIV/AIDS Pathway
Non-Modifiable risk
Modifiable risk
Population Rate
Percent of Population
Rate per 100,000 Population
60%
50%
40%
30%
20%
10%
0%
400
350
300
250
200
150
100
50
0
R/E - Black {S}
R/E - Hispanic {S}
Age - 25-44 {S}
Gender - Male {S}
No condom use during most recent sex (12-17 yrs) {C}
Injection of illegal drug (*SD City High School Students) {Y}
4 or more partners (*SDCity High School Students) {Y}
4 or more partners (18-24) {C}
Never had HIV test (18-24) {C}
STDs - Chlamydia {ST}
STDs - Gonorrhea {ST}
STDs - Syphilis {ST}
AIDS {HA}
Deaths - HIV/AIDS (13+) {D}

Infant Mortality



Characteristics of Female Residents, San Diego County
Selected Elements from Infant Mortality Pathway



(*Fetal mortality rate per 1,000 births & fetal deaths)

Obesity

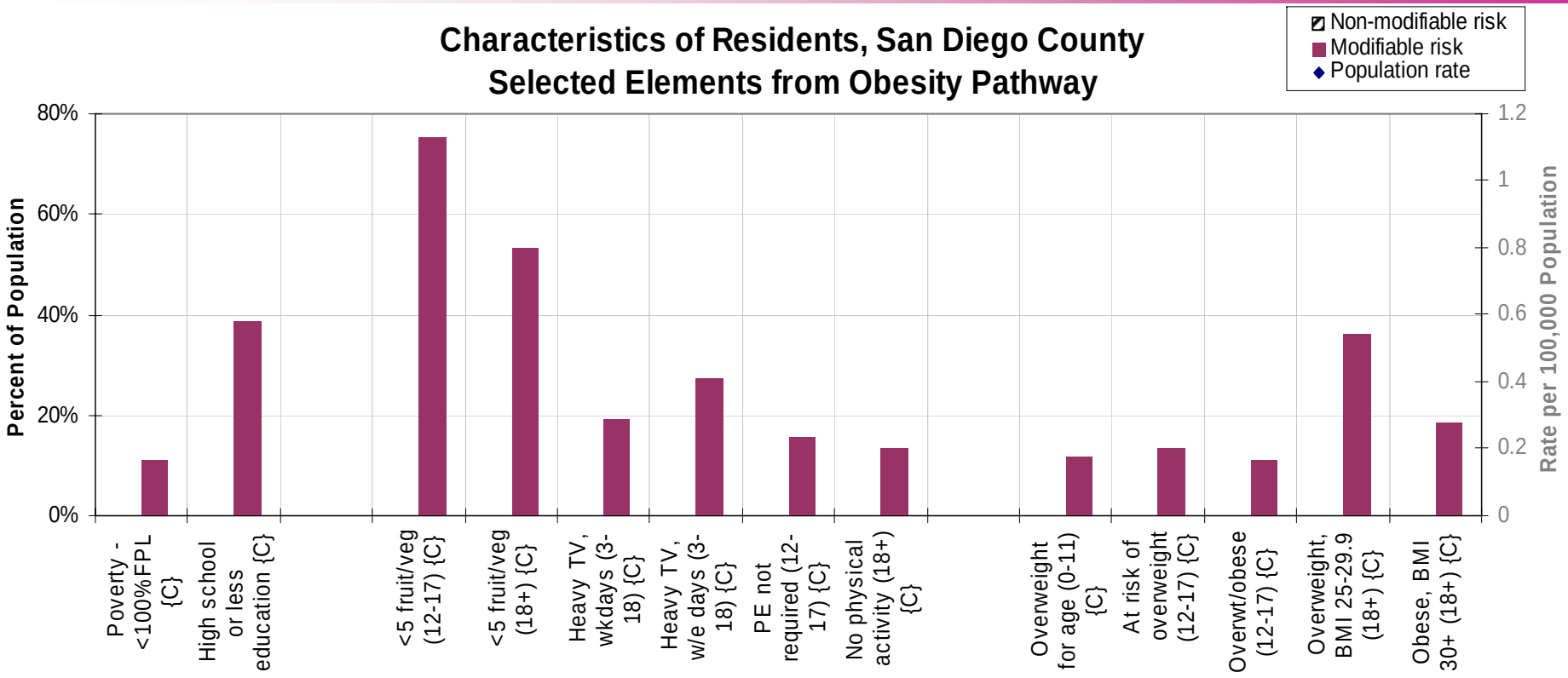
Opportunities for Prevention

Primary	Secondary	Tertiary
Demographic Risk Factors*	**Behavioral & Social Risk Factors***	**Intermediate Outcomes**
Genetics/family history	Lack of physical activity	Eating disorders
Socioeconomic status	Sedentary lifestyle	Overweight
Limited education	Excessive screen time	
Poor family functioning	Poor nutrition	
	Limited fresh food access	

Birth → Obesity

*Social Determinants of Health

Characteristics of Residents, San Diego County
Selected Elements from Obesity Pathway



Asthma

Opportunities for Prevention

Birth

Primary

Demographic Risk Factors*
Race/ethnicity
Genetics/family history
Age (very young, older)
Gender (male)
Urban location

Secondary

Behavioral & Social Risk Factors*
Tobacco use
Lack of regular medical care
Depression
Lack of flu vaccination
Arthropod dander
Air quality

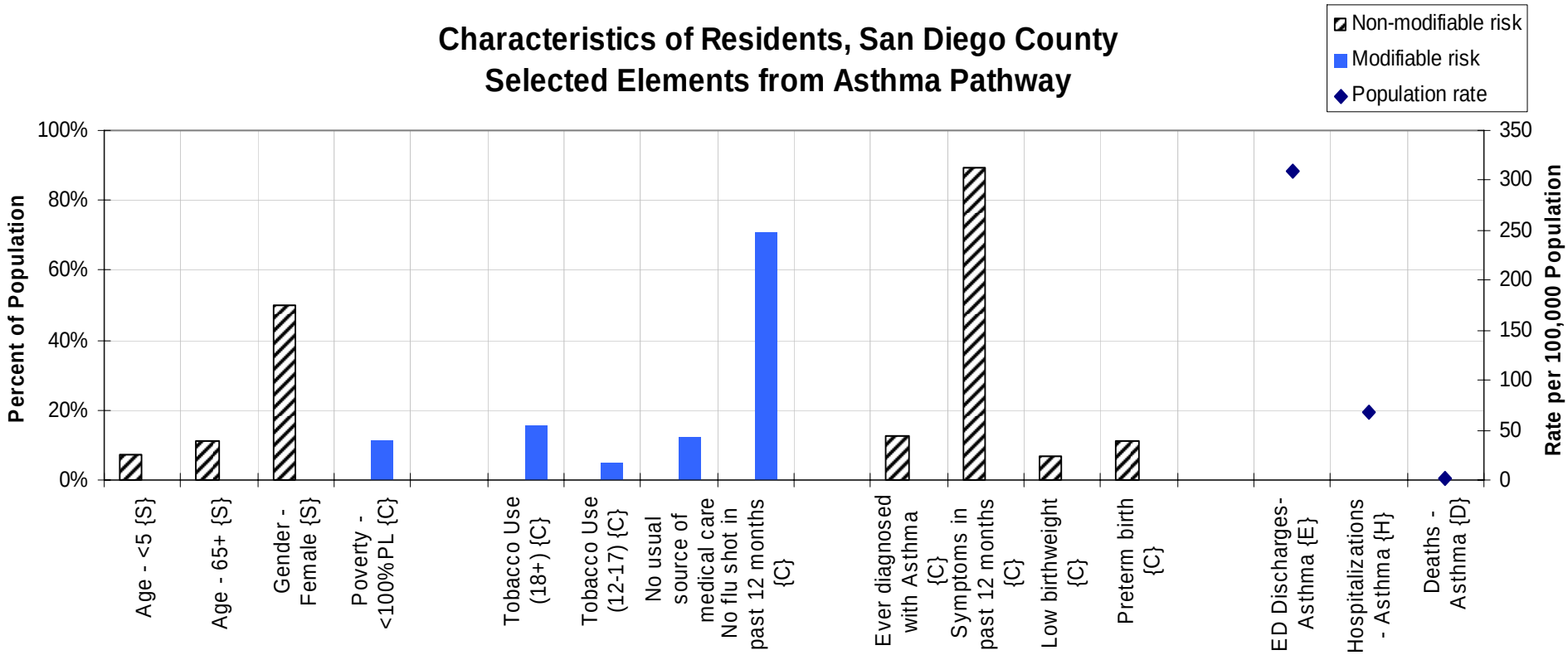
Tertiary

Intermediate Outcomes
Low birth weight
Premature birth
Allergic rhinitis
Early childhood wheezing
School absenteeism
Atopic dermatitis

Asthma Death

*Social Determinants of Health

Characteristics of Residents, San Diego County
Selected Elements from Asthma Pathway



Data Sources

Data Sources
Data in grids are shown with a source code in brackets { }. The full sources are described below.

{B} CA, DHS, Center for Health Statistics, 2004 (infant mortality rate) and 2005 (all other rates) Birth Statistical Master Files. County of San Diego, Health & Human Services Agency, Maternal, Child and Family Health Services.

{BD} California Birth Defects Monitoring Program, registry data 1999-2003, livebirths and stillbirths over 20 weeks, http://www.cbdmp.org/gd_sandiego.htm, accessed 4/9/09.

{C} California Health Interview Survey (CHIS), 2007 askCHIS (cancer screening, sexual partners) and 2005 askCHIS (all other variables), http://www.chis.ucla.edu/main/default.asp, accessed 3/12/09.

{D} 2005 Death Statistical Master Files (CA DPH), County of San Diego, Health & Human Services Agency, Community Epidemiology; SANDAG, Current Population Estimates, 9/27/2006.

{E} HASD&IC, CHIP, County of San Diego, Health & Human Services Agency, Emergency Medical Services, 2007 Emergency Department Database; SANDAG, Current Population Estimates, 7/15/2008. Note ED Discharge data include only those treated and discharged and does not include those admitted to hospital.

{HA} County of San Diego, Health & Human Services Agency, HIV/AIDS Epidemiology Unit, 2005 HIV/AIDS Reporting System; SANDAG, Current Population Estimates, 9/27/2006.

{H} 2005 Hospital Discharge Data, (CA OSHPD), County of San Diego, Health & Human Services Agency, Community Epidemiology; SANDAG, Current Population Estimates, 9/27/2006.

{S} San Diego Association of Governments (SANDAG), Data Warehouse, 2008 Estimates, http://datawarehouse.sandag.org/, accessed 12/2008.

{ST} County of San Diego, Health & Human Services Agency, HIV, STD and Hepatitis Branch, 2005 Morbidity Database; SANDAG, Current Population Estimates, 9/27/2006.

{Y} YRBS: Centers for Disease Control and Prevention, Youth Risk Behavior Surveillance System, 2007 YRBS, http://apps.nccd.cdc.gov/yrbss/SelHealthTopic.asp?Loc=SA, accessed 3/12/09. Note these data are from San Diego Unified School District which is high schools in the City of San Diego, students in grades 9-12. These data do not represent all of San Diego County.

Indicator Definitions

Using the Critical Pathway Data
The data in the Critical Pathway graphs provide information about the general population. Some of the data describe the percent of the general population *(or female population for Infant Mortality)* that has the risk factor characteristic. Other data describe the rate of disease or medical encounter in the population.

With a brief review, users may identify potential high impact targets risk groups in the population. The higher the bar in most cases, the more of that risk factor in the general population; so, look for the highest bars to target high impact. For example, if poor nutrition is very high in the population, programs focused on improving nutrition will provide a "big bang for your buck". Conversely, if the percent of Blacks in the population is relatively low, interventions focused only on these high risk but small group might have less of an impact on the overall disease continuum. Remember however, a targeted focus such as this may go a long way in reducing a disease disparity.

Another way to use the graphs is to look at the medical encounter rates (right side of graphs). Consider the differences in rates of emergency department discharges and hospitalizations compared to death. It may also be useful to compare the patterns of medical encounters between different disease pathways. Caution should be used when directly comparing numbers and rates as years and other data considerations may vary.

If you need assistance interpreting, please feel free to contact the Community Health Statistics Unit.

The Critical Pathway data labels are abbreviated. Please read the following indicator definitions for explanations of the indicator data provided. See also source page for data references.

Definitions listed alphabetically for percent of population, then for rates. Definitions are excerpted from the notes or glossaries of data sources.

Percent of Population:
<5 fruit/veg: Percent of respondents who eat less than 5 servings of fruit /vegetables daily. This variable is available from askCHIS who constructed it with several questionnaire items and applies variance adjustments to measure dietary intake among adults in California. The indicator is presented in several pathways by various age groups as noted in parenthesis ( ).

4 or more partners (*SD City High School Students): Percent of population responding that they have had sexual intercourse with 4 or more persons in their life. This survey is done in the San Diego Unified School District which include City of San Diego high school students in grades 9-12. These data do not represent all of San Diego County.

4 or more partners: Percent of population responding that they have had 4 or more sexual partners in the past 12 months. This is

Indicator Definitions, cont.

asked of adults who did not use a proxy to answer survey and refers to those ages 18-24.

At risk of overweight: Percent of adolescent population classified as at risk of being overweight, based on age and gender specific BMI percentile of 85th up to 95th percentile, calculated using self-reported height and weight. This refers to children ages 12-17.

Diabetes: Percent of population responding who have ever been told by a doctor that they have diabetes, other than during pregnancy. This is asked of adults and refers to ages 18+.

Ever diagnosed with asthma: Percent of population responding who was ever told by a doctor that they had asthma. This is asked of all ages 1 year and older.

Heavy TV, w/e days: Percent of population responding that they usually watch TV or play video games 4 or more hours per day on the weekends. This refers to youth ages 3-17.

Heavy TV, wkdays: Percent of population responding that they watch TV or play video games in their free time, 3 or more hours on a typical weekday. This refers to youth ages 3-17.

High blood pressure: Percent of population responding who was ever told by a doctor that they have high blood pressure. This is asked of adults and refers to ages 18+.

High cholesterol: Percent of population responding who was told by a doctor, the last time their cholesterol was checked, that their blood cholesterol was high. This is asked of adults who have had their cholesterol checked within the past 5 years and refers to ages 18+.

HS or less education: Percent of population whose highest level of education completed is high school or lower level. For Obesity this refers to ages 18+; for Infant Mortality this refers to female population ages 18-44.

Injection of illegal drug (*SD City High School Students): Percent of population responding that they have injected illegal drugs. This survey is done in the San Diego Unified School District which includes City of San Diego high school students in grades 9-12. These data do not represent all of San Diego County.

Low birthweight: Percent of live births born less than 2,500 g (approximately 5.5 lbs). Note: this is proportion of live births, not total population.

Indicator Definitions, cont.

Never had HIV test: Percent of population responding that they have never been tested for HIV. This refers to adults ages 18-24.

No condom use (*SD City High School Students): Percent of population responding that they or their partner did not use a condom during last sexual encounter, amongst those who are currently sexually active. This survey is done in the San Diego Unified School District which is City of San Diego high school students in grades 9-12. These data do not represent all of San Diego County.

No flu shot: Percent of population responding that they have not had a flu shot in the past 12 months. This is asked of all ages over 6 months old.

No physical activity: Percent of population who report no physical activity, based on reported level of physical activity. This is asked of adults and refers to ages 18+ or ages 65+ as noted in parentheses ( ).

No recent mammogram: Percent of female population responding that their last mammogram was more than 2 years ago or have never had a mammogram, based on responses to several questions about women's health. This is asked of women and refers to ages 40+, (based on CDC recommendations of a mammogram every 1-2 years for women 40+).

No recent pap: Percent of female population responding that their last Pap test was more than 3 years ago or have never had a Pap smear, based on responses to several questions about women's health. This is asked of women 18+ who have never had a hysterectomy.

No reg. source med. care: Percent of population responding that they do not have a usual place to go when sick or need health advice; no regular source of medical care. This is asked of all ages.

Noncompliance, colorectal cancer screening: Percent of population responding to several questions on their cancer screening behaviors. Compliance is based on the 2001 to 2004 U.S. Preventive Services Task Force (USPSTF) recommendations for the 50+ population. This is asked of adults ages 50+.

Obese, BMI 30+: Percent of population classified as obese based on self reported height and weight and calculated adult BMI. This refers to adults ages 18+.

Overweight for age: Percent of child population classified as overweight based on weight , sex and age using NCHS growth charts. This variable does not factor height of child. This refers to children ages 0-11.

Overweight, BMI 25-29.9: Percent of population classified as overweight based on self reported height and weight and calculated

Indicator Definitions, cont.

adult BMI. This refers to adults ages 18+.

Overwt/obese: Percent of adolescent population classified as overweight or obese based on age and gender specific BMI percentile of highest 5th percentile, calculated using self-reported height and weight. This refers to children ages 12-17.

PE Not required: Percent of population responding they are not required to take PE. This is asked of adolescents who attend a school that offers PE and does not include home-schoolers. This refers to children ages 12-17.

Poverty - <100%FPL: Percent of households living below 100% of the Federal Poverty Level (FPL), based on reported household income as a percentage of the Federal Poverty Level (FPL). Poverty level information for 2005 by family size can be found by clicking here. For Infant Mortality pathway, percent of females of child bearing age at the specified poverty level. For all other pathways, data includes all ages.

Preterm birth: Percent of live births born prior to 37 complete weeks of gestation, where length of gestation was known. Note: this is proportion of live births, not total population.

Prior heart disease: Percent of population responding who have ever been told by a doctor that they have any kind of heart disease. This is asked of adults and refers to ages 18+ or ages 65+ as noted in parenthesis ( ).

Prior stroke: Percent of population responding who have ever been told by a doctor that they had a stroke. This is asked of adults and refers to ages 18+.

R/E - White, Black, Hispanic: (Race/Ethnicity) Percent of population of specified race(s) or ethnicity based on self-identification; White refers to non-Hispanic White population; Black refers to non-Hispanic Black population; Hispanic refers to Hispanics without reference to race. For Infant Mortality pathway, percent of females of child bearing age that report the specified race/ethnicity.

Symptoms in past 12 months: Percent of population responding that they still have asthma and/or report that they had an episode/ attack within the past 12 months, among those who have ever been diagnosed with asthma. This is asked of all ages 1 year and older.

Tobacco use: Percent of population responding to several smoking-related questions to determine current smoking status as either current or not current smoker. This is asked of adolescents and adults and refers to ages 12-17 or ages 18+ as noted in parentheses ( ).

Indicator Definitions, cont.

Rates:

AIDS: Incidence, new cases reported by providers to County Public Health Services, number per 100,000 population. Cases need not be investigated and confirmed. For more information, see CDC clinical case definition.

Birth defects: number of deaths due to structural anatomic birth defects and mental retardation, per 1,000 live births and fetal deaths. Examples of defects include serious heart defects or chromosome abnormalities.

Deaths - Asthma: Underlying cause of death of asthma, ICD-10 codes J45-J46, number per 100,000 population.

Deaths - Cancer: Underlying cause of death of cancer, ICD-10 codes C00-C97, number per 100,000 population.

Deaths - CHD: Underlying cause of death of coronary heart disease, ICD-10 codes I11, I20-I25, number per 100,000 population.

Deaths - Diabetes: Underlying cause of death of diabetes, ICD-10 codes E10-E14, number per 100,000 population.

Deaths - HIV/AIDS: Underlying cause of death of HIV, ICD-10 codes B20-B24, number per 100,000 population. This refers to deaths of those ages 13+.

Deaths - Stroke: Underlying cause of death of stroke, ICD-10 codes I60-I69, number per 100,000 population.

ED Discharges - Asthma: Emergency Department discharge for principal diagnosis of asthma, ICD-9 code 493, number per 100,000 population.

ED Discharges - CHD: Emergency Department discharge for principal diagnosis of coronary heart disease, ICD-9 codes 402, 410-414, 429.2, number per 100,000 population.

ED Discharges - Diabetes: Emergency Department discharge for principal diagnosis of diabetes, ICD-9 code 250, number per 100,000 population.

ED Discharges - Stroke: Emergency Department discharge for principal diagnosis of stroke, ICD-9 codes 430-438, number per 100,000 population.

Indicator Definitions, cont.

Fetal Mortality: Deaths of fetuses at least 20 complete weeks of gestation, number per 1,000 live births and fetal deaths.

Hospitalizations - Asthma: Hospitalization for principal diagnosis of asthma, ICD-9 code 493, number per 100,000 population.

Hospitalizations - CHD: Hospitalization for principal diagnosis of coronary heart disease, ICD-9 codes 402, 410-414, 429.2, number per 100,000 population.

Hospitalizations - Diabetes: Hospitalization for principal diagnosis of diabetes, ICD-9 code 250, number per 100,000 population.

Hospitalizations - Stroke: Hospitalization for principal diagnosis of stroke, ICD-9 codes 430-438, number per 100,000 population.

Infant Mortality: Number of deaths of infants under one year of age per 1,000 live births.

Low birth weight: Birth weight less than 2,500 g (approximately 5.5 lbs), number per 1,000 live births.

No early PNC: Live births where prenatal care (PNC) did not begin during the 1st trimester of pregnancy, per 1,000 live births where start of PNC is known.

Preterm birth: Births prior to 37 complete weeks of gestation per 1,000 live births where length of gestation was known.

STDs-Chlamydia: Incidence, new cases reported to County Public Health Services, number per 100,000 population. Cases need not be investigated and confirmed. For more information, see CDC clinical case definition.

STDs-Gonorrhea: Incidence, new cases reported to County Public Health Services, number per 100,000 population. Cases need not be investigated and confirmed. For more information, see CDC clinical case definition.

STDs-Syphilis: Incidence of primary and secondary syphilis, new cases reported to County Public Health Services, number per 100,000 population. For more information, see CDC clinical case definition.

Resource Links

Resource Links

The following resources and reports are available on the Community Health Statistics Website at www.SDHealthStatistics.com:

Community Profiles— contain county wide, regional and community level data for the most commonly requested health and demographic indicators. They contain the most recent demographic and health data, and are continually updated. There are seven profiles, one for each region and a county-wide profile. The profiles are best viewed online to ensure the latest version and utilize electronic navigation features of the PDFs.

Health Indicator Maps—are PDF versions of maps that allow a quick visual survey of community health rates. Selected health indicator rates are mapped by community (Subregional Area, SRA). Indicators include death, hospitalization and emergency department discharge for the top chronic diseases.

Disease Information Packets—several tools to inform and guide users from lay people to public health professionals. The tools included are a 1-page "Introduction to Disease", a several page "Brief" for professionals, a "Starter PowerPoint" for use in presentations and these "Critical Pathways".

The website also links to other Branches and Groups in Public Health Services, as well as other sites with local, state or national data. For more information, please contact the Community Health Statistics Unit.

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Health and Human Services Agency

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Bill Horn, District Five

Chief Administrative Officer
Walter F. Ekard

Health and Human Services Agency Director
Nick Macchione, MS, MPH, FACHE

Public Health Services Public Health Officer
Wilma J. Wooten, MD, MPH