Chronic Kidney Disease

What is Chronic Kidney Disease?

Chronic Kidney Disease (CKD) is a condition in which kidney function is gradually lost overtime.[1] The disease occurs when kidneys are unable to filter waste and excess fluids from the body as well as they should. The slow loss of kidney function can eventually lead to kidney failure, which is the end-stages of kidney disease.[2] However, not every person with CKD will come to the end-stages of the disease.[3] It is important to note as many as 9 in 10 adults with CKD do not know they have the disease.[4] Due to CKD symptoms being general and ill-defined signs and symptoms may not appear until kidney damage has worsen significantly.[1]

Five stages of CKD: There are 5 stages of CKD, where both kidneys lose function over a period of time.[5]

Stage 1: Mild early stages of kidney damage with mostly normal kidney function.

Stage 2: Early-stage kidney damage, with mild decrease of kidney function.

Stage 3A: Mild to moderate loss of kidney function.

Stage 3B: Moderate to severe loss of kidney function.

Stage 4: Severe damage with minimum kidney function

Stage 5: Most severe kidney damage (kidney failure). Will need to be on dialysis.

Risk Factors for Chronic Kidney Disease

Demographic Risk Factors

- *Age*
    - CKD becomes more common as one ages.[5] Adults aged 65 years or older have a higher risk of developing CKD.[4]
- *Sex*
    - Female adults have a slightly higher risk of developing CKD. According to the 2017-2020 National Health and Nutrition Examination Survey, 12% of males and 14% of females had CKD in stages 1-4.[4]
- *Race/Ethnicity*
    - From 2017-2020, African American adults had the highest risk of developing CKD compared to other races/ethnicities.[4]
- *Genetics or Family History*
    - The risk to developing CKD is higher, if a closely related blood relative has the disease.[5]

Social and Behavioral Risk Factors

- *Diabetes*
    - Diabetes occurs when the body has difficult regulating blood sugar levels. Both type 1 and 2 diabetes can lead to kidneys damaged over time if not managed correctly.[5]
        - Approximately 1 in 3 adults with diabetes may have CKD.[6]
- *High Blood Pressure*
    - High blood pressure can weaken the blood vessels and reduce the volume of blood the kidneys can filter over time, which can lead to a gradual decrease of kidney function.[5]
        - Approximately 1 in 5 adults with high blood pressure may have CKD.[6]
- *Obesity*
    - Obesity is directly linked to the development of diabetes and high blood pressure, which are common causes of CKD. Additionally, there is still a risk of developing CKD if one is obese and does not have diabetes or high blood pressure.[7]
- *Long history of pain relief medication*
    - Overuse and misuse of pain relief medications can cause severe damage to kidney function. Common pain relief medications include ibuprofen, naproxen, and higher dose aspirin. When using these medications, instructions labels should be read carefully and followed accordingly.[8]
- *Smoking*
    - Smoking can elevate blood pressure and reduce blood flow to the kidneys. Overtime, prolonged smoking may gradually impair kidney function, leading to long term damage.[5,9]

Intermediate Outcomes

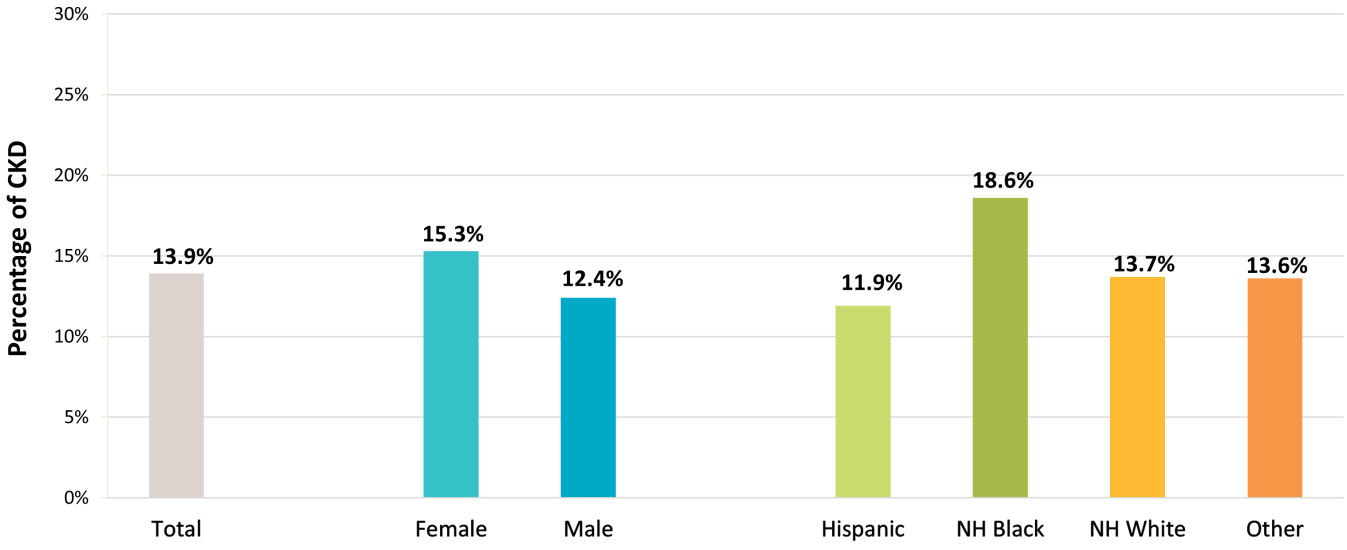
- *Anemia*
    - Anemia occurs from not having enough healthy red blood cells available.[10] This is a very common condition among people with CKD. Anemia usually develops in the early stages of CKD.[110]
- *Mineral and Bone Disorder*
    - This health condition is commonly seen in patients with CKD, leading to weakened bones. As kidney function declines, the body is unable to regulate hormones and mineral levels, causing an imbalance in the blood.[12]
- *Gout*
    - A subtype of arthritis that primarily effects the toes, due to the large amount of uric acid. This condition is one of the most common health problems caused by CKD. In few cases, gout can be a contributor to CKD.[11]
- *Heart Disease*
    - Heart disease is the leading cause of death among CKD patients on dialysis. This is partly due to the heart working overtime to pump blood into the kidneys, which gradually weakens the heart.[11]
- *Weak Immune System*
    - A side effect of CKD is a fragile immune system. This makes patients of CKD more vulnerable to opportunistic infections.[1]

Chronic Kidney Disease

National Statistics and Disparities

- More than 1 in 7 American adults have CKD.[3]
- Kidney diseases are a leading cause of death in the United Sates.[3]
- In the United States, diabetes and high blood pressure are the leading causes of kidney failure, accounting for 2 out of 3 new cases.[3]

Diagnosed Chronic Kidney Disease (CKD) Among Adults by Sex and Race/Ethnicity, United States, 2017-2020



Source: Centers for Disease Control and Prevention. Chronic Kidney Disease Surveillance System—United States. http://nccd.cdc.gov/CKD/Default.aspx
NH refers to non-Hispanic.

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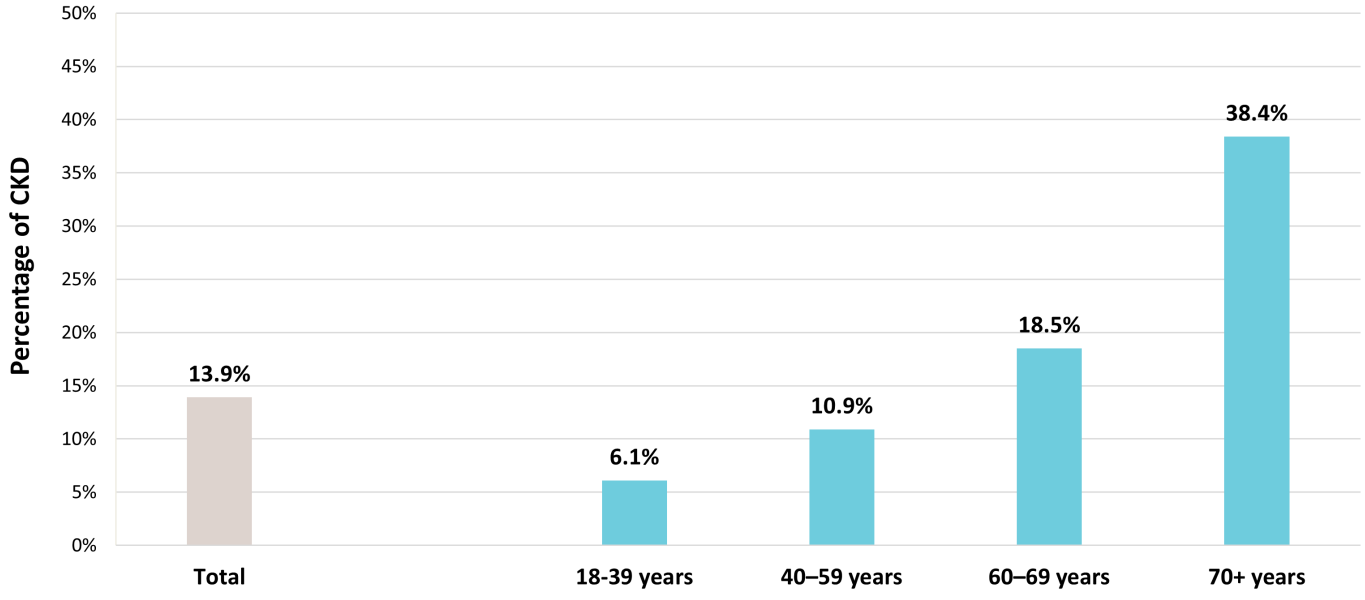
- From 2017-2020, females in the United States were shown to have a higher risk of being diagnosed with CKD at 15.3 % compared to males at 12.4%.[13]
- From 2017-2020, non-Hispanic Black Americans in the United States had the highest risk of being diagnosed with CKD at 18.6%.[13]

Chronic Kidney Disease



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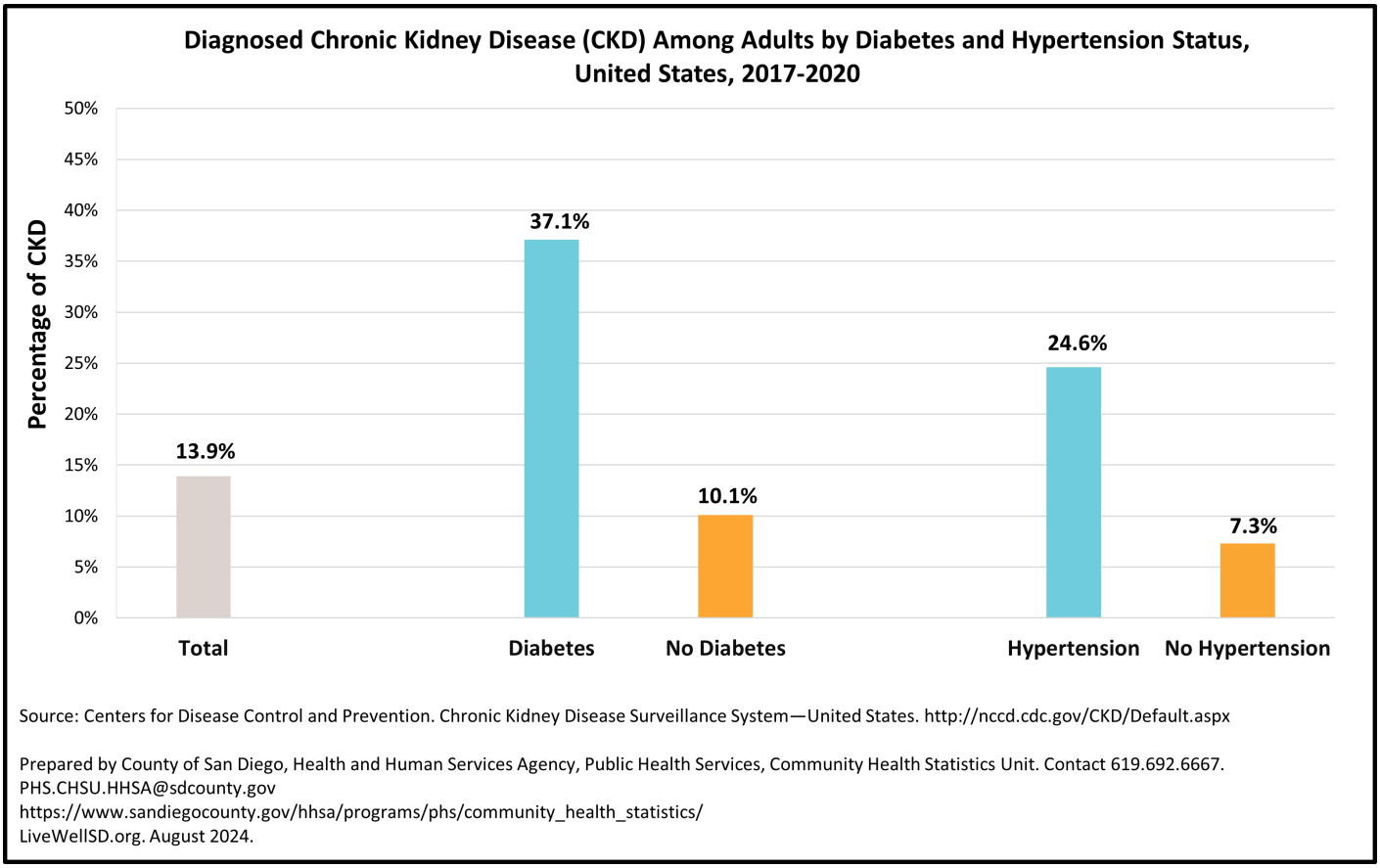
- From 2017-2020, adults aged 70 years and older in the United States had the highest risk of being diagnosed with CKD at 38.4%.[13]
- From 2017-2020, adults aged 70 years and older are twice as likely to be diagnosed with CKD compared to adults aged 60-69 years old (18.5%).[13]

Chronic Kidney Disease



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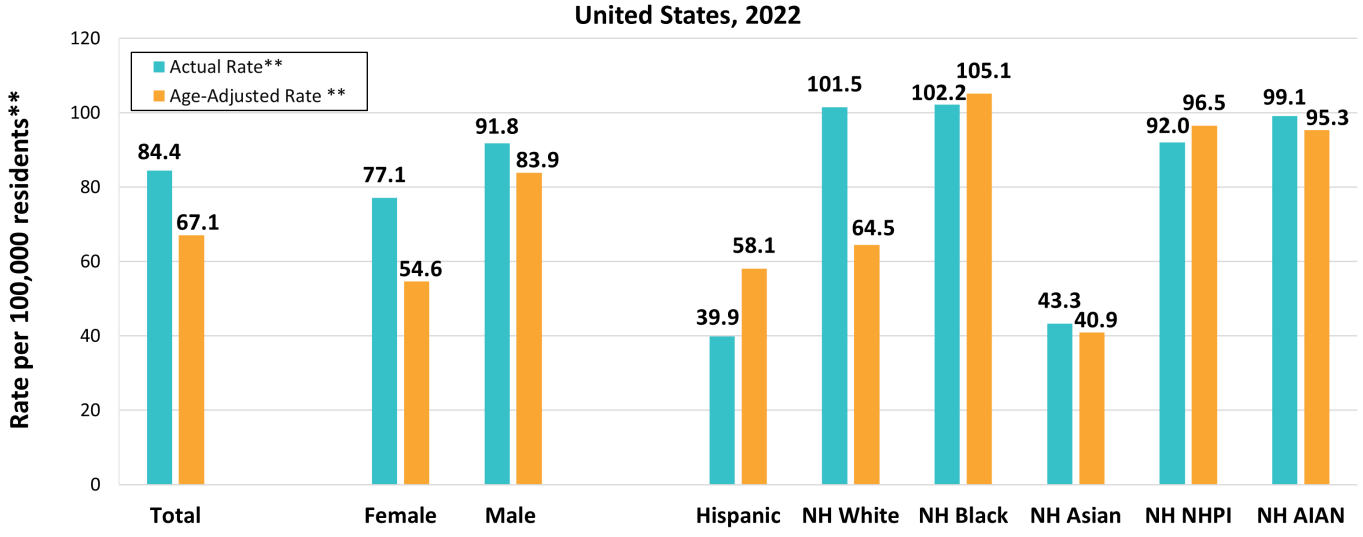
- In the United States, between 2017-2020, adults with diabetes had a higher risk of being diagnosed with CKD at 37.1%, compared to adults who did not have diabetes.[13]
- From 2017-2020 in the United States, adults with hypertension had a higher risk of being diagnosed with CKD at 24.6%, compared to adults with no hypertension.[13]
- Overall, adults with diabetes had a higher risk of being diagnosed with CKD compared to adults with hypertension.[13]

Chronic Kidney Disease



*CKD Death refers to (multiple cause of death) ICD- 10 codes N03-N05, N13.0-N13.3, N17-N19, N25-N26, N28.0, N28.8.
**Rates per 100,000 residents. Age-adjusted rates are per 100,000, adjusted to the 2000 U.S. standard population.
NH refers to non-Hispanic. NHPI refers to Native Hawaiian and Other Pacific Islander. AIAN refers to American Indian/Alaska Native.
Source: Centers for Disease Control and Prevention, National Center for Health Statistics. National Vital Statistics System, Mortality 2018-2022 on CDC WONDER Online Database, released in 2024.

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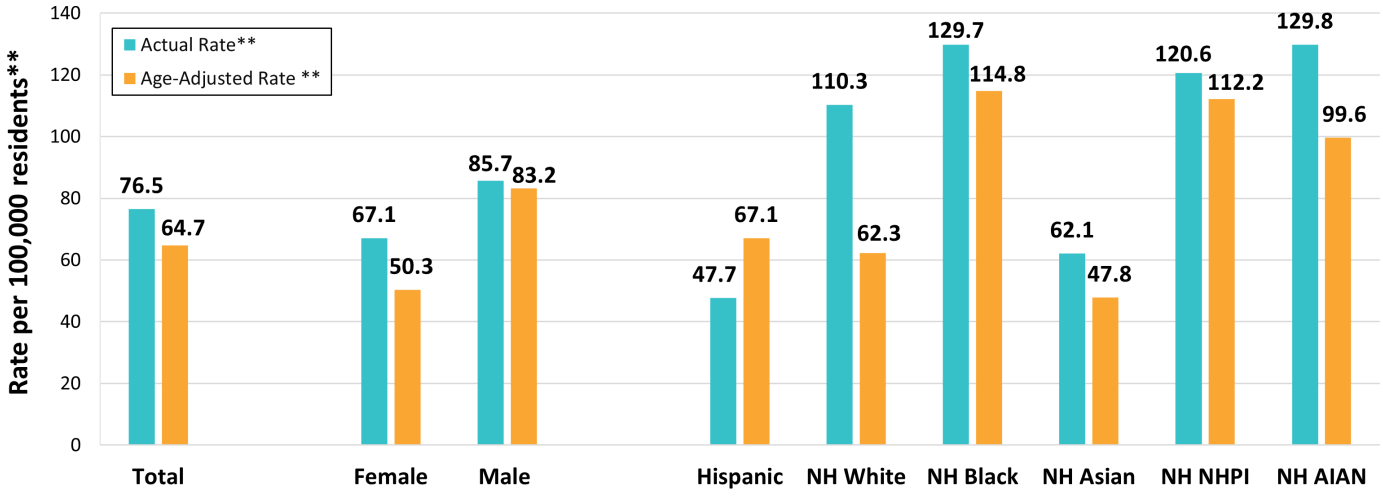
- In 2022, males in the United States had a higher actual death rate (91.8 per 100,000) due to CKD compared to females (77.1 per 100,000).[14]
- Non-Hispanic Black residents in the United States had the highest actual death rate (102.2 per 100,000) due to CKD compared to other races/ethnicities, in 2022.[14]

Chronic Kidney Disease

State Statistics and Disparities

Chronic Kidney Diease (CKD) Death*: Actual and Age-Adjusted Rates, California, 2022**



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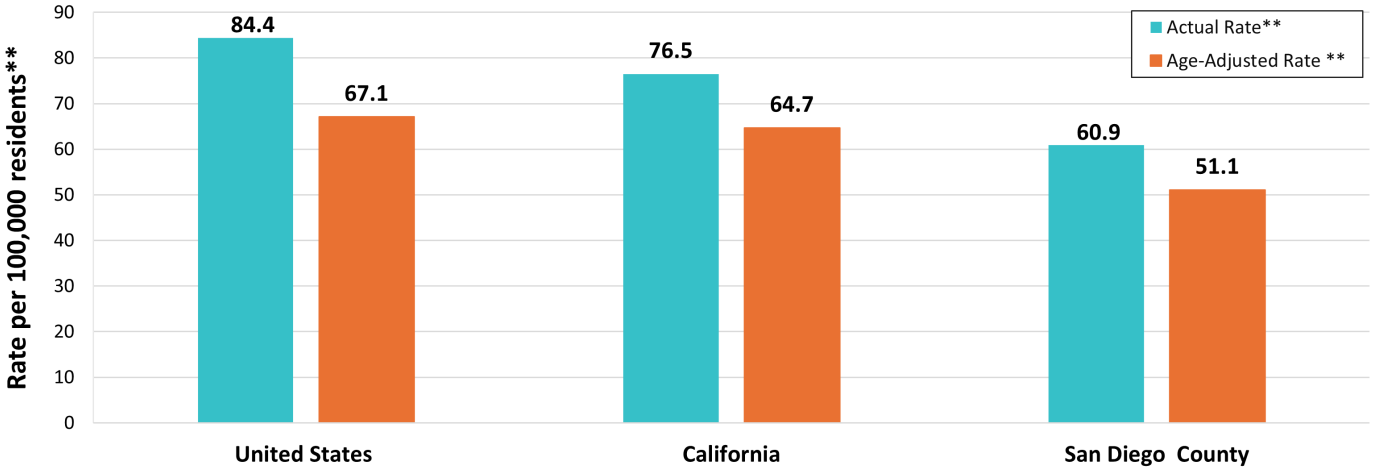
- In 2022, male residents in California had a higher actual death rate (85.7 per 100,000) due to CKD compared to female residents (67.1 per 100,000).[14]
- Non-Hispanic American Indian and Alaska Native residents in California had the highest actual death rate (129.8 per 100,000) due to CKD compared to other races/ethnicities, in 2022.[14]
- Non-Hispanic Black residents in California had the second highest actual death rate (129.7 per 100,000) due to CKD.[14]

Chronic Kidney Disease

National, State, Local Statistics

National, State, and Local Chronic Kidney Disease (CKD) Actual and Age-Adjusted Death* Rates, 2022**



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Source: Centers for Disease Control and Prevention, National Center for Health Statistics. National Vital Statistics System, Mortality 2018-2022 on CDC WONDER Online Database, released in 2024.
Source: California Department of Public Health, Center for Health Statistics, Office of Health Information and Research, Vital Records Business Intelligence System (VRBIS), 2022. SANDAG Population Estimates, 2022 (vintage: 11/2023).

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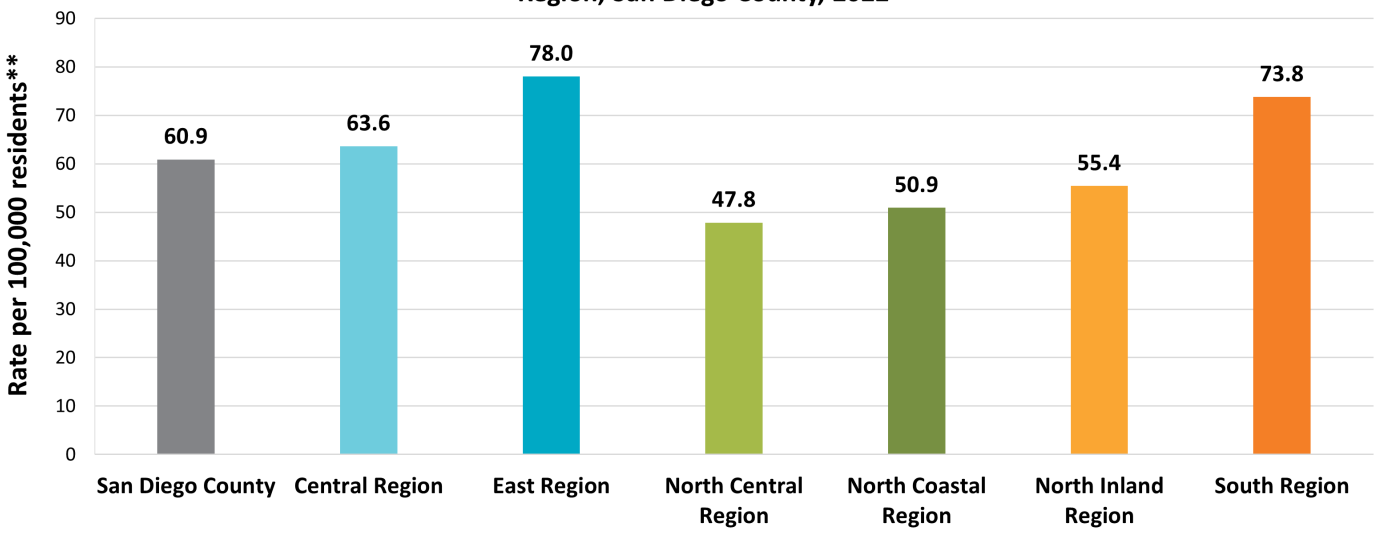
- In 2022, San Diego County had a lower actual death rate (60.9 per 100,000) due to CKD, when compared to California and the United States.[14]

Chronic Kidney Disease

Local Statistics and Disparities



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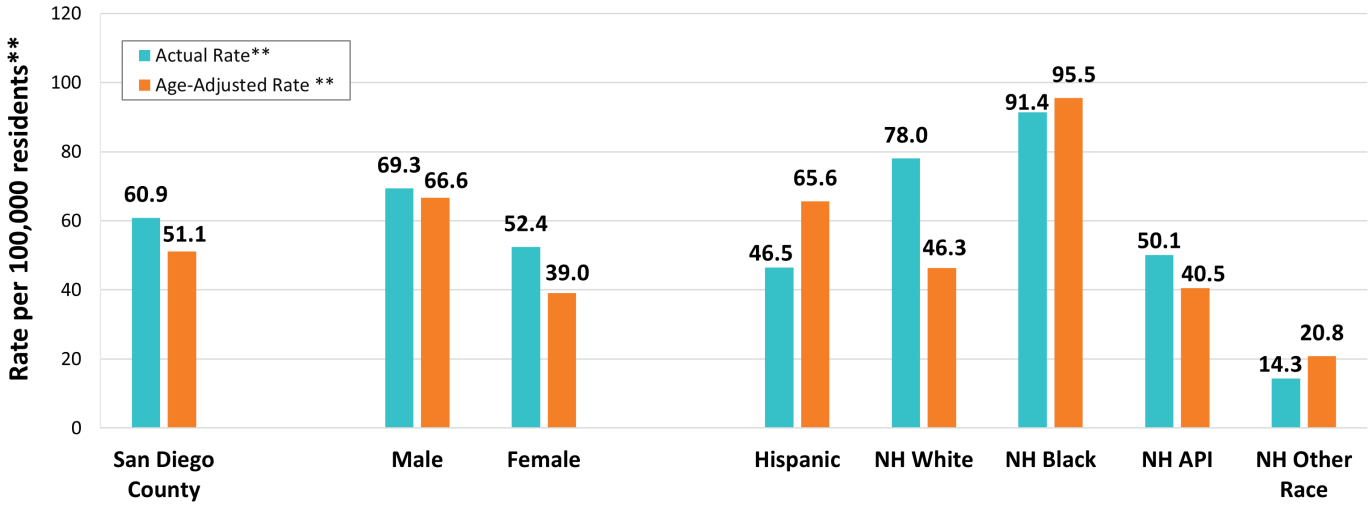
- In 2022, East Region had the highest death rate due to CKD (78.0 per 100,000), followed by South Region (73.8 per 100,000) compared to all other HHSA regions and San Diego County overall (60.9 per 100,000).[15]
- In 2022, among all HHSA regions, North Central Region had the lowest death rate due to CKD (47.8 per 100,000), followed by North Coastal Region (50.9 per 100,000) in San Diego County.[15]

Chronic Kidney Disease



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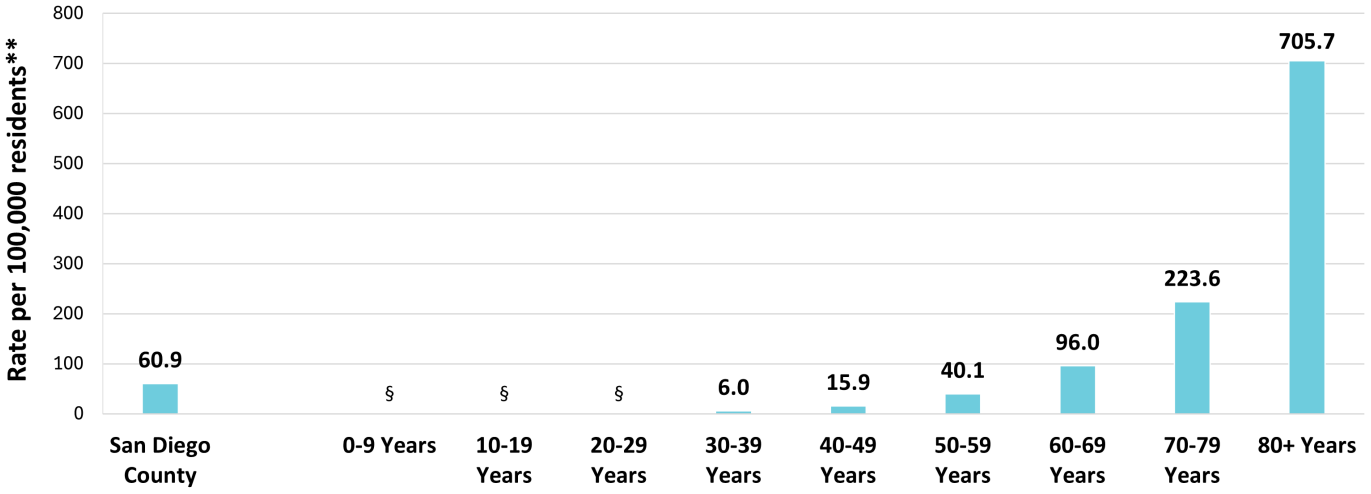
- In 2022, male residents had a higher actual death rate due to CKD (69.3 per 100,000) compared to female residents (52.4 per 100,000) in San Diego County.[15]
- Non-Hispanic Black residents in San Diego County had the highest death rate (95.5 per 100,000) due to CKD than all other races/ethnicities, in 2022.[15]

Chronic Kidney Disease



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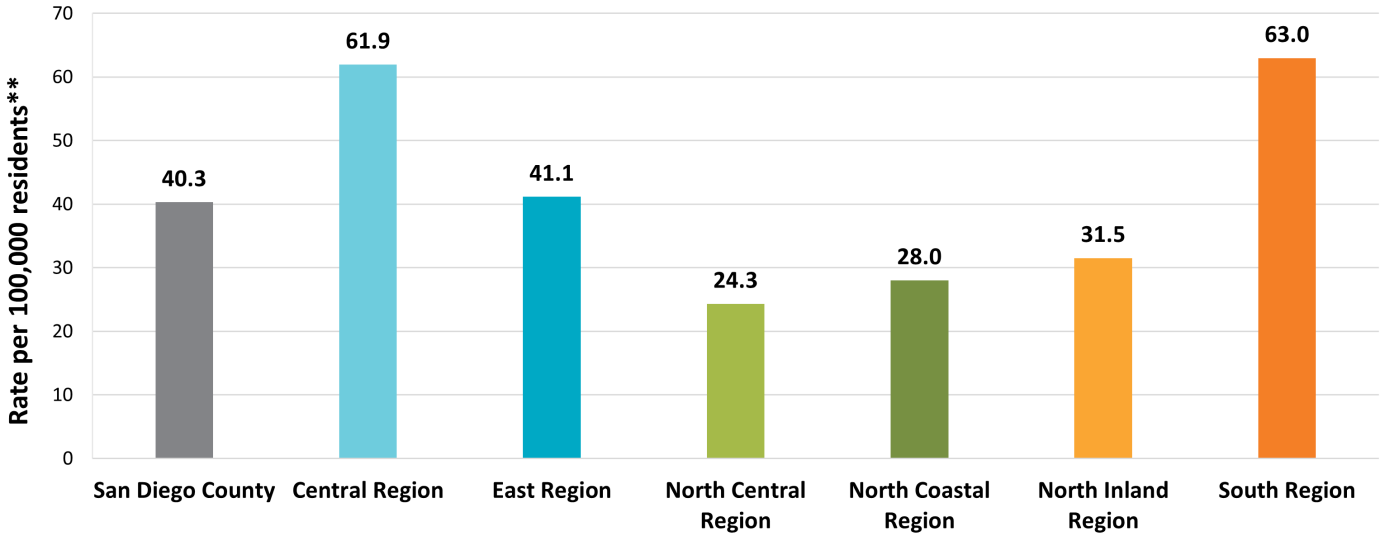
- In 2022, San Diego County residents aged 60 years and older had higher rates of death due to CKD compared to the younger age groups.[15]
- San Diego County residents aged 80 and older had the highest rate of death due to CKD (705.7 per 100,000) than all other age groups in 2022.[15]

Chronic Kidney Disease



*Hospitalization refers to treatment at a general acute care facility in San Diego County.
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Source: California Department of Health Care Access and Information (HCAI), Patient Discharge Database, 2022.
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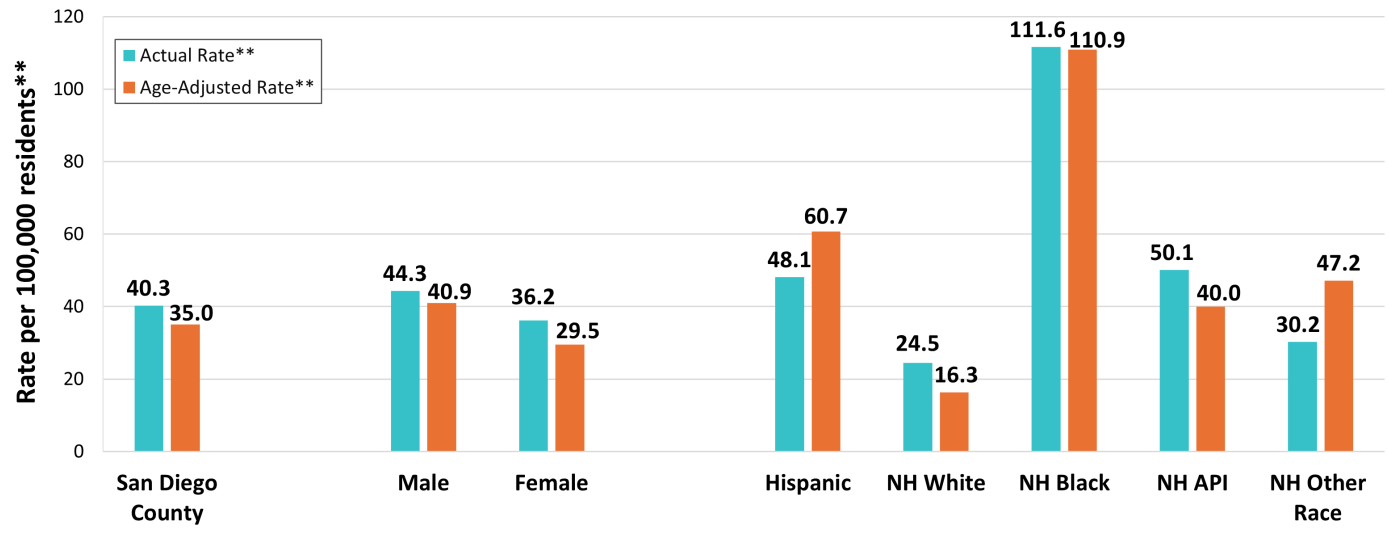
- In 2022, the total CKD hospitalization rate in San Diego County was 40.3 per 100,000 residents.[16]
- The CKD hospitalization rate in 2022 was highest in South Region (63.0 per 100,000) and Central Region (61.9 per 100,000) compared to other HHSA regions.[16]

Chronic Kidney Disease



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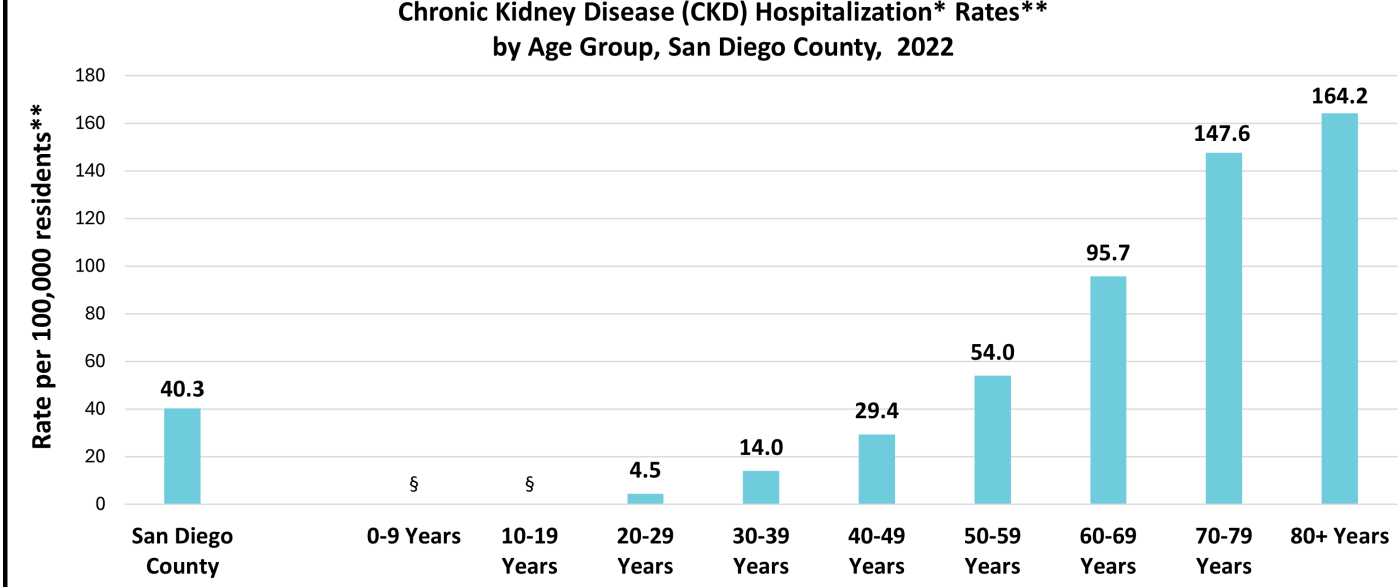
- In 2022, the CKD actual hospitalization rate was 40.3 per 100,000 residents and age-adjusted rate was 35.0 per 100,000 residents in San Diego County overall.[16]
- In 2022, the CKD actual hospitalization rate in San Diego County was highest among non-Hispanic Black residents (111.6 per 100,000) than all other races/ethnicities.[16]
- The CKD actual hospitalization rate in San Diego County was higher among male residents (44.3 per 100,000) than female residents (36.2 per 100,000), in 2022.[16]

Chronic Kidney Disease



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- In 2022, San Diego residents aged 80 years and older had the highest CKD hospitalization rate (164.2 per 100,000) than all other age groups.[16]

Chronic Kidney Disease: Prevention for Individuals

Get check-ups regularly

- Often CKD has no symptoms until the later stages of the disease.[17] Therefore, it is important to receive a regular check-up from your physician. Individuals with high blood pressure, diabetes, or family history of CKD should especially seek testing.[17,18]

Maintain blood pressure

- High blood pressure can damage your kidneys overtime and increase the risk of CKD diagnosis. Managing your blood pressure through regular exercise, maintaining a healthy weight, and reducing salt and alcohol intake can help lower blood pressure.[18] Please consult with your physician to understand your target range and best practices for managing your blood pressure.[3]

Eat a well balanced diet

- Following a healthy diet can help lower blood pressure and maintain a healthy weight. The Mediterranean Diet is a widely recommended plan most individuals can utilize. This diet emphasizes fresh fruits and vegetables, fat-free or low-fat milk products, whole grains, fish, poultry, beans, seeds, and nuts. Additionally, it encourages reducing intake of sodium, added sugar, unhealthy fats, and red meat.[1,18]

Be active 30 minutes a day

- Regular exercise can help reduce blood pressure, lower cholesterol, manage blood sugar, and maintain a healthy weight, all of which lower the risk of CKD.[18,19]

No smoking/Quit smoking

- Smoking can increase blood pressure and interfere with blood pressure medications.[3] Quitting smoking can help lower your risk of developing or worsening an existing CKD diagnosis.[19]
    - For more assistance on quitting smoking go to https://smokefree.gov

Limited alcohol

- Excessive drinking can lead to increased blood pressure and extra added sugar and calories. Limit yourself to one drink per day if you are a woman, and two drinks per day if you are a man.[20]

Take pain relief medication only as directed

- Avoid overusing pain relief medication, as long-term misuse can cause severe kidney damage. Always follow the instructions on labels and use only as recommended.[8]

Chronic Kidney Disease

Prevention Tools for Public Health Professionals: Chronic Kidney Disease Critical Pathway

There are many opportunities for public health professionals in the community to help reduce the risk of chronic kidney disease and to improve the health outcomes of individuals who already have the disease. To assist in community health efforts, a Chronic Kidney Disease Critical Pathway was developed.

The Chronic Kidney Disease Critical Pathway is a tool to be used in health promotion and disease prevention efforts. Its purpose is to identify populations at greater risk for chronic kidney disease, and to identify prevention and early intervention opportunities. The Chronic Kidney Disease Critical Pathway displays a diagram of the major risk factors and intermediate outcomes or related diseases that have an impact on, or result from, chronic kidney disease. Risk factors are marked as non-modifiable (black striped bars) such as race/ethnicity or sex and modifiable (solid colored bars) such as high blood pressure and smoking status.

Beneath the risk factors diagram is a data grid describing the San Diego resident population in relation to selected elements of the pathway. The data grid is designed to assist in quick identification of opportunities for interventions that might have a high impact on a particular disease. The data represents all San Diegans, not only those with a particular disease. The left axis (bar) indicates the percent of the population with a known risk factor or intermediate outcome. The right axis (diamond) indicates the rate of a particular medical encounter within the population that is specified. The data are described fully in the complete version of the Critical Pathways.

In addition, the Community Health Statistics Unit website (www.SDHealthStatistics.com) 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.

Chronic Kidney Disease Critical Pathway

Critical Pathway

Chronic Kidney Disease

COUNTY OF SAN DIEGO HEALTH AND HUMAN SERVICES AGENCY

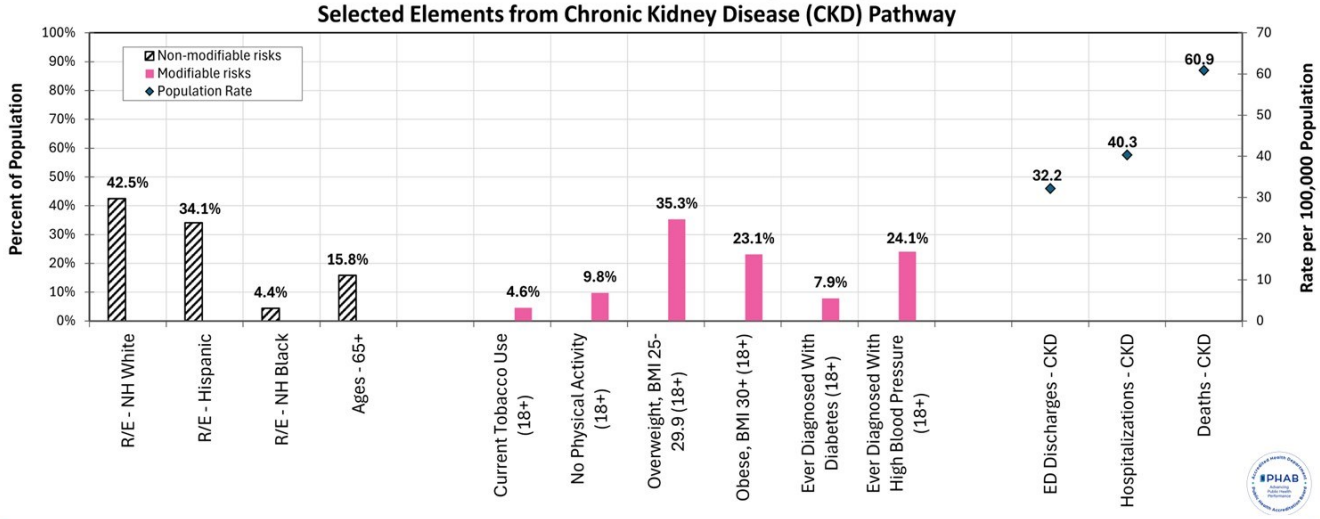
LIVE WELL SAN DIEGO

OPPORTUNITIES FOR PREVENTION

	PRIMARY	SECONDARY	TERTIARY	
Birth	**Demographic Risk Factors*** Age (older), Race/ethnicity (R/E), Genetics/family history, Sex (female incidence), Sex (male death)	**Social & Behavioral Risk Factors*** Smoking (tobacco), Misuse of pain relief medication, Obesity, Diabetes, High blood pressure, Lack of physical activity	**Intermediate Outcomes** Heart disease, Mineral and bone disease, Gout, Anemia, Opportunistic infections	Chronic Kidney Disease Death

*SOCIAL DETERMINANTS OF HEALTH

Characteristics of Residents, San Diego County
Selected Elements from Chronic Kidney Disease (CKD) Pathway



County of San Diego ■ Health and Human Services Agency ■ Public Health Services ■ Community Health Statistics Unit ■ www.SDHeathStatistics.com ■ (619)692-6667 08/2024

Data Sources

[1] Mayo Foundation for Medical Education and Research. (2023, September 6). *Chronic kidney disease*. Mayo Clinic. Mayo Clinic. https://www.mayoclinic.org/diseases-conditions/chronic-kidney-disease/symptoms-causes/syc-20354521

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[4] Centers for Disease Control and Prevention. (2024a, May 15). *Chronic kidney disease in the United States, 2023*. Centers for Disease Control and Prevention. https://www.cdc.gov/kidney-disease/php/data-research/index.html

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