Kidney Disease in Georgia
2005

The People at Risk.
The Power to Prevent.

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The Power to Prevent.

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Executive Summary

Kidney Disease

- Kidney disease is among the most common, serious, and costly chronic diseases in Georgia and the United States.
- Kidney disease is the ninth leading cause of death in Georgia, accounting for 1,475 deaths in 2003, equivalent to four deaths every day.
- The age-adjusted mortality rate of kidney disease in Georgia has been 30% to 40% higher than that of the United States since 1980.
- Males are 1.3 times more likely than females to die from kidney disease, and blacks are 2.6 times more likely than whites.
- Although the total number of deaths due to kidney disease in blacks was less than in whites, both black men and black women were more likely to die of kidney disease prematurely than their white counterparts.

End-Stage Renal Disease (ESRD)

- The age-adjusted ESRD incidence rate for Georgia has been consistently higher than that of the United States since 1980.
- Males are 1.3 times more likely than females to develop ESRD, and blacks are 4.3 times more likely than whites.
- In 2002, there were about 14,600 patients with ESRD in Georgia.
- In 2002, the estimated cost of health care for ESRD patients in Georgia was approximately $905 million.
- The primary causes of ESRD are diabetes and hypertension, accounting for more than 70% of all cases.

Introduction

Kidney disease is a leading cause of death and medical expenditure in Georgia and the United States.

Kidney disease in this report

The kidneys are two bean-shaped organs, located near the middle of the back, one on each side, just below the rib cage. Under normal conditions, the kidneys maintain normal water and acid-base balance and remove waste and excess water from the body. They also help keep blood pressure within the normal range.

The kidneys can be damaged by a variety of things. High blood pressure and diabetes are the most common causes of kidney damage, but the kidneys can also be damaged by infectious, chemical, metabolic, mechanical, and genetic conditions. The term *kidney disease* refers to a partial or complete loss of kidney function. Loss of normal kidney function may lead to heart disease, bone disease, anemia, and nerve damage, but it may also be fatal in and of itself.

If detected early, the progression of kidney disease and its complications can be delayed. Unfortunately, mild loss of kidney function has no symptoms. In contrast, severe loss has a broad spectrum of possible symptoms, including weakness, difficulty concentrating, shortness of breath, swelling of the hands, feet, or face, loss of appetite, and nausea. Certain types of kidney disease, if untreated, can cause progressive loss of kidney function and eventually kidney failure. Persons with kidney failure cannot survive without receiving dialysis or a transplant, an irreversible condition called end-stage renal disease (ESRD) (1).

Purpose of this report

This report intends to summarize the burden of kidney disease in Georgia. Presentation and discussion of kidney disease may be confusing for several reasons: the kidneys are complicated organs; they can be damaged by a wide range of factors; the terminology and the numerical classification or coding system used to discuss kidney diseases are complicated; and kidney disease may be caused by other common diseases, notably hypertension and diabetes. Understanding the complexities of the terminology, the coding scheme, and the relationship among diabetes, hypertension and kidney disease are particularly important to this report.

• Terminology

Words derived from English, Latin, and Greek are all used to describe the kidney and its diseases. *Kidney* comes from Middle English, *renal* comes from Latin, and several words beginning with *nephr-* (e.g., *nephrology, nephritis*) come from Greek (1). The use of words from these three language sources is well accepted and understood within the medical community, but it can be confusing for non-medical readers, especially at first.

One example of this confusing terminology is the use of *end-stage renal disease* for the most severe stage of kidney disease. Persons with terminal kidney disease, that is, persons who must receive dialysis or transplant to stay alive, are said to have end-stage renal disease (ESRD) instead of end-stage kidney disease. The impact of ESRD is discussed in more detail later in this report.

• Coding

Grouping of diseases or conditions with similar causes, symptoms, or treatments is often done to simplify discussion and planning. In this report, we have summarized information about kidney disease using two common, different, and overlapping ways to group and discuss kidney disease. Both groupings capture important aspects of kidney disease, but the people in the two groups are not completely the same.

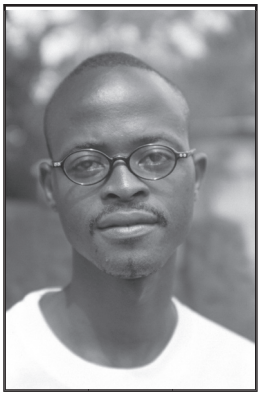
First, based on information from death certificates and standard groupings established by a consensus of international public health groups, we summarize information about persons whose deaths were related to "nephritis, nephrotic syndrome, and nephrosis" as underlying cause of death. Deaths due to "nephritis, nephrotic syndrome, and nephrosis" include almost all persons who die from kidney disease (2). In this report, we use *kidney disease* to refer to this group of conditions even though a few persons who die from kidney disease are not included.

Second, we present information about all persons in Georgia with end-stage renal disease (ESRD) whether or not the disease originated in the kidneys or elsewhere. For example, persons who develop kidney failure because they have diabetes are included among those with ESRD even though the origin of their kidney problem is diabetes.

• Diabetes and hypertension

Diabetes and hypertension, especially if poorly controlled, can damage the kidneys and cause kidney failure. The relationship between hypertension and kidney disease is particularly complicated because not only does high blood pressure cause kidney damage but kidney damage can cause high blood pressure.

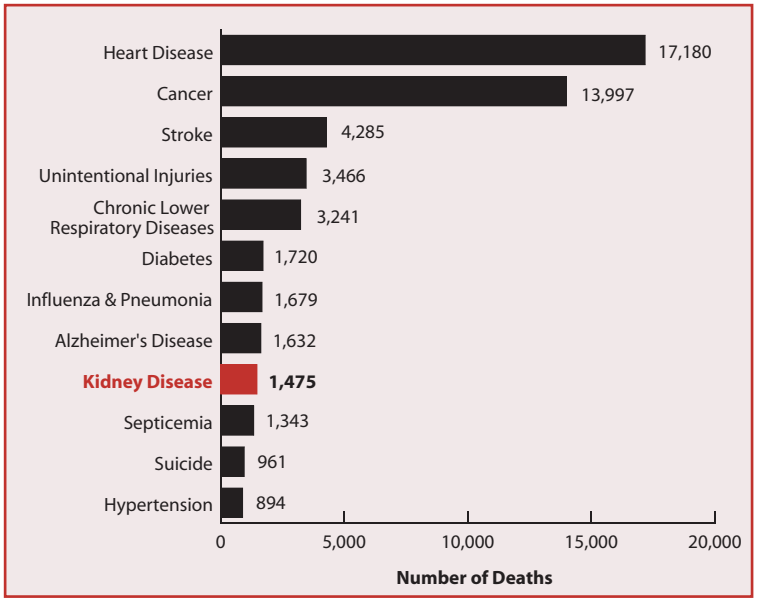


Mortality From Kidney Disease In Georgia

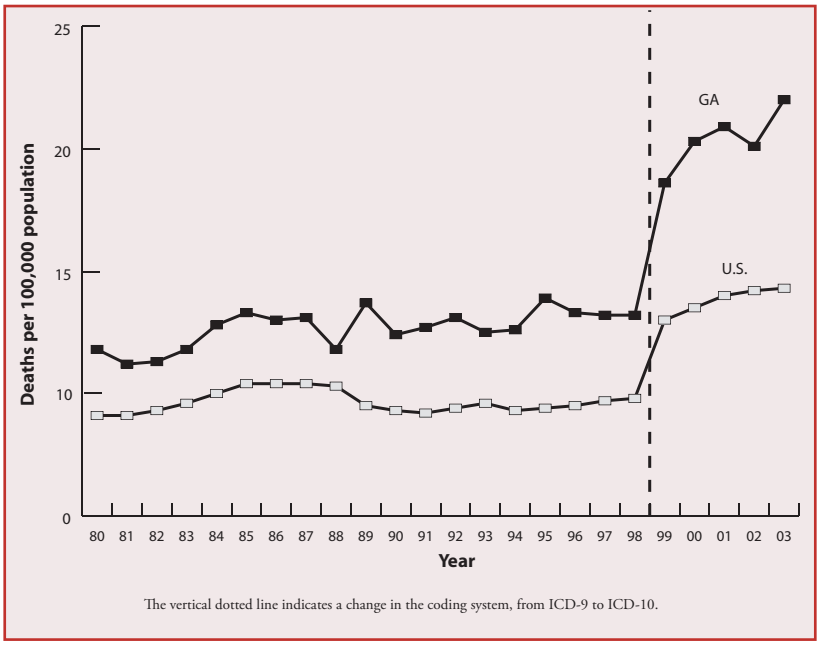
Kidney disease is among the most common, serious, and costly diseases in Georgia as well as in the United States. In 2003, kidney disease was the ninth leading cause of death in Georgia (*Figure 1*), accounting for 1,475 deaths. The age-adjusted death rate for kidney disease in Georgia during 1999 through 2003 was 20.3 deaths per 100,000 population.

Figure 1. Leading causes of death, Georgia, 2003



The age-adjusted death rate of kidney disease in Georgia has been consistently higher than that of the United States (*Figure 2*). From 1980 through1998, the rate in Georgia was about 31% higher every year. From 1999 through 2002, the gap even became wider, and on average the rate in Georgia was about 46% higher than the national rate. The sudden increase in rates in 1999 for both Georgia and the United States was due to a change in the coding scheme (from ICD-9 to ICD-10; see Appendix for the detail). The new coding system, ICD-10, classifies and records kidney disease deaths more completely than the previous coding system.

Figure 2. Age-adjusted kidney disease death rates, Georgia and the United States, 1980-2003



In Georgia, age-adjusted death rates of kidney disease from 1999 through 2003 were higher for males (24.0 per 100,000) than for females (18.4 per 100,000); and higher for blacks (40.2 per 100,000) than for whites (15.3 per 100,000). During the same period, the age-adjusted death rate for black males (44.5 per 100,000) was more than

two times higher than for white males (19.4 per 100,000), and the age-adjusted death rate for black females (37.8 per 100,000) was almost three times higher than for white females (13.0 per 100,000) (*Figure 3*).

The age-adjusted death rate of kidney disease in Georgia has been consistently higher than that of the United States.

Death rates due to kidney disease were highest among older Georgians. The age-specific death rate for kidney disease increased from 2.2 per 100,000 for persons less than 55 years of age to 378.0 per 100,000 for persons aged 85 years and older, an increase of more than 170-fold (*Figure 4*).

Of the 6,612 deaths from kidney disease in Georgia during 1999 through 2003, 1,492 deaths (23%) occurred in people less than 65 years of age. The proportion of deaths before age 65 was highest for black males. One hundred (38%) of the 266 deaths from kidney disease in black men occurred before age 65 (*Table 1*).

Table 1. Premature deaths from kidney disease by race and sex, Georgia, 2003

	Total deaths	Premature[1] deaths Number	Percent[2]
Black males	266	100	37.6%
Black females	339	82	24.2%
White males	427	94	22.0%
White females	429	61	14.2%

1 = death before 65 years of age.
2 = percent of total deaths for a given race-sex category.

Figure 3. Age-adjusted kidney disease death rates by race and sex, Georgia, 1999-2003

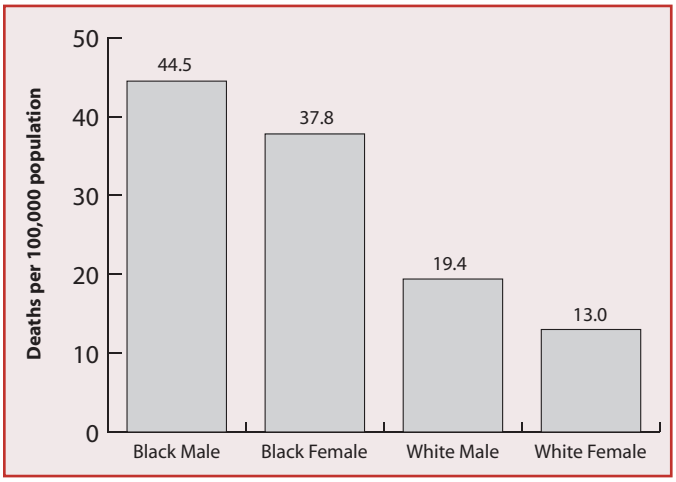
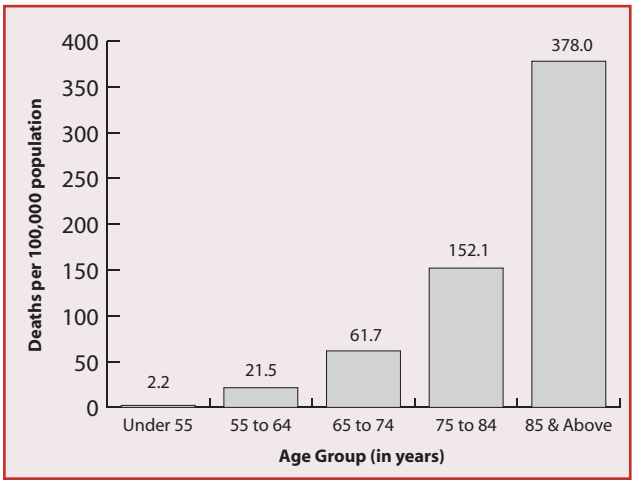


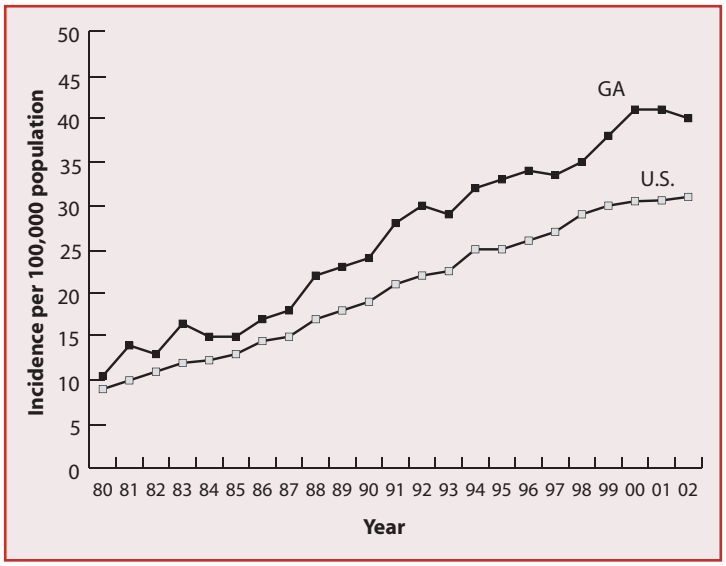
Figure 4. Age-specific kidney disease death rates, Georgia, 1999-2003



Incidence and Prevalence of End-Stage Renal Disease (ESRD) in Georgia

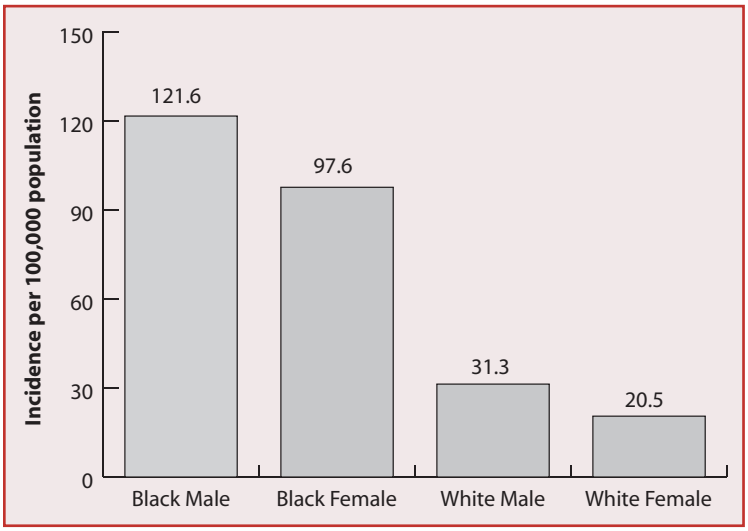
The age-adjusted incidence* of end-stage renal disease (ESRD) in both Georgia and the United States has steadily increased from 1980 to 2002 (*Figure 5*). The incidence rate in Georgia has been consistently higher than the national rate, and the gap has increased over time. The average annual increase in the incidence rate from 1980 through 2002 for Georgia has been 6.7%; the increase for the United States has been 6.1%. In 2002, the annual ESRD incidence rates were 43.8 per 100,000 population for Georgia and 34.9 per 100,000 population for the United States.

Figure 5. Age-adjusted ESRD incidence rates, Georgia and the United States, 1980-2002



In Georgia, the age-adjusted incidence rate for ESRD in 2002 was higher for males (51.0 per 100,000) than for females (38.9 per 100,000); and higher for blacks (107.9 per 100,000) than for whites (24.8 per 100,000). The incidence rate for black males (121.6 per 100,000) was nearly four times higher than for white males (31.3 per 100,000), and the incidence rate for black females (97.6 per 100,000) was about five times higher than for white females (20.5 per 100,000) (*Figure 6*).

Figure 6. Age-adjusted ESRD incidence rates by race and sex, Georgia, 2002



In 2002, the age-specific incidence rates for ESRD ranged from 16.2 per 100,000 for persons less than 55 years of age to 201.5 per 100,000 for persons 75-84 years of age, an increase of more than 12-fold (*Figure 7*).

** Incidence is the number of **new cases** of ESRD per 100,000 population in a certain time period, usually a year.*

In Georgia, the age-adjusted prevalence* of ESRD has increased since 1980 as its incidence rate went up steadily. The number of Georgians living with ESRD is growing faster than the incidence of ESRD because more people acquire the disease every year than die from it (*Figure 8*). In 2002, approximately 14,600 people in Georgia had ESRD. With an average cost of $62,000 per dialysis patient per year, the total health care cost of ESRD for Georgia in 2002 was estimated at $905 million.

Figure 7. Age-specific ESRD incidence rates, Georgia, 2002

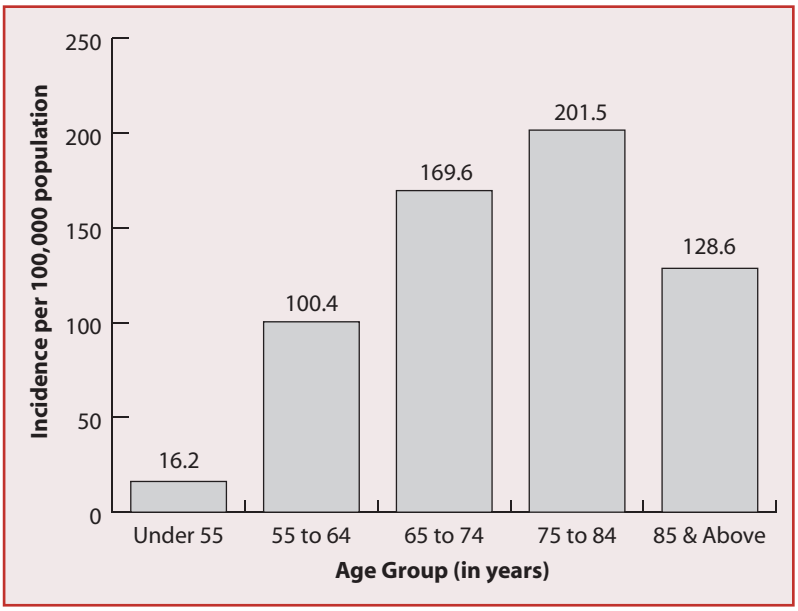
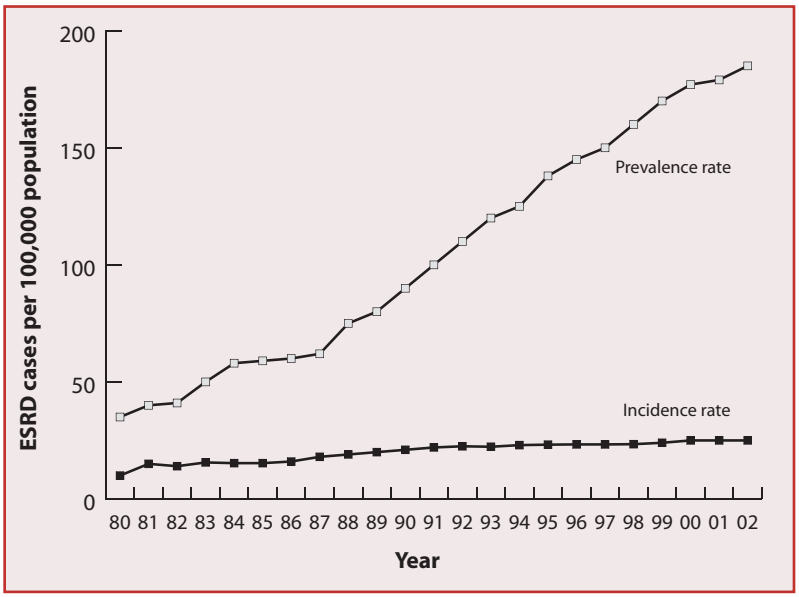


Figure 8. Age-adjusted ESRD prevalence and incidence rates, Georgia, 1980-2002



** Prevalence is the number of **existing cases** of ESRD per 100,000 population at a specific point in time, no matter how long the person has had ESRD.*

Kidney Disease Mortality and End-Stage Renal Disease (ESRD) Incidence and Prevalence by County

The age-adjusted death rate, incidence rate, and prevalence rate for kidney disease differed from county to county in Georgia (*Table 2*). The age-adjusted death rate ranged from 8.4 per 100,000 population in Madison County to 49.8 per 100,000 population in Hancock County.

White County had the lowest incidence rate for ESRD (17.5 per 100,000), and Dooly County had the highest incidence rate (112.1 per 100,000).

Oconee County had the lowest prevalence rate for ESRD (62.1 per 100,000), and Terrell County had the highest prevalence rate (569.2 per 100,000). Counties in North Georgia were more likely to have lower prevalence of ESRD compared to the state. Counties with significantly higher prevalence of ESRD than the state prevalence were mostly located in the Southwest and the Mid-eastern part of Georgia (*Figure 9*).

Figure 9. Age-adjusted ESRD prevalence rates by county, Georgia, 2002

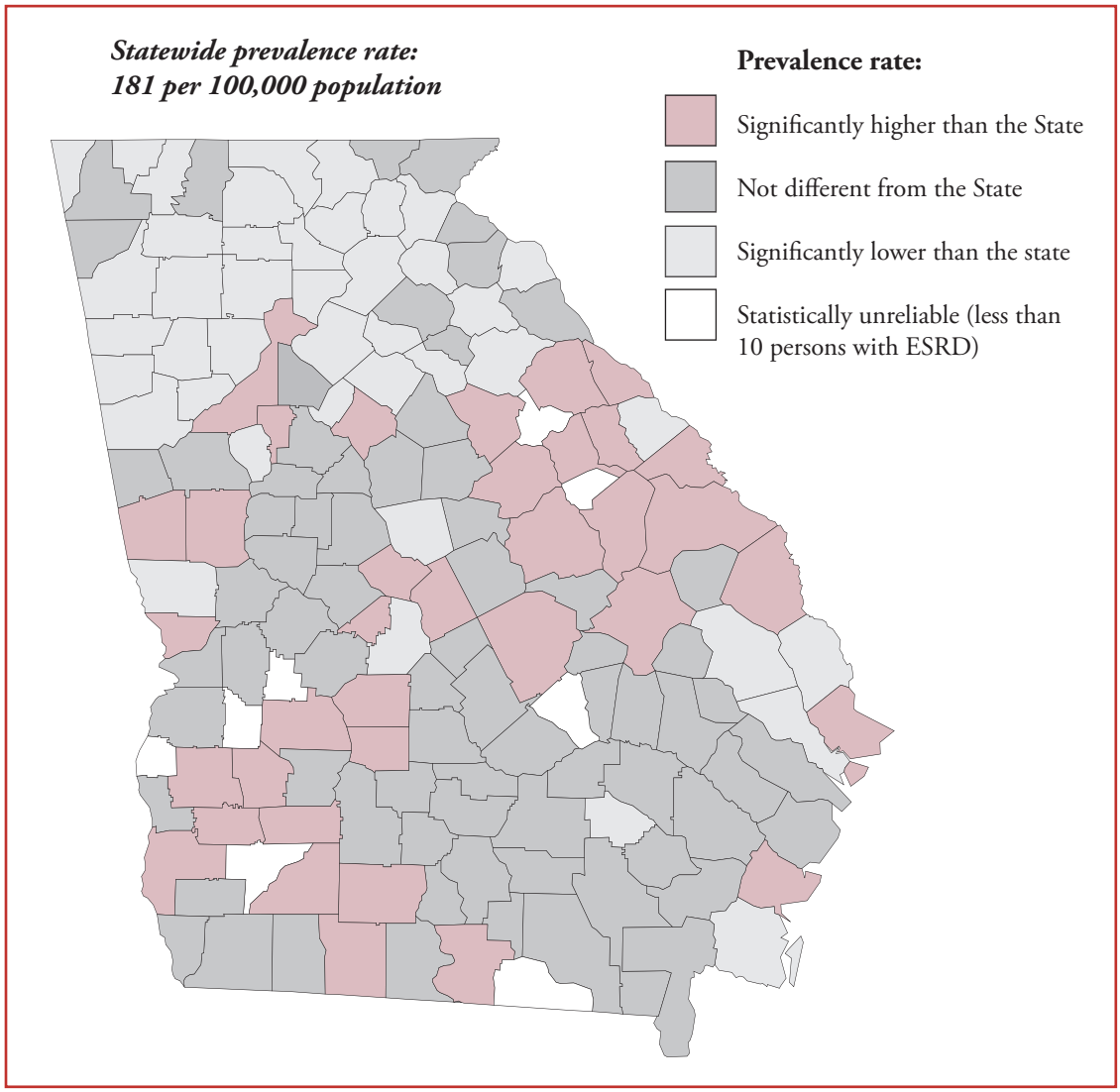


Table 2. Age-adjusted kidney disease death rates and incidence, prevalence, and estimated health care costs for End-Stage Renal Disease (ESRD) by county, Georgia, 1999-2003.

County	Mortality (1999-2003)		End-Stage Renal Disease				
			Incidence (2000-2002)		Prevalence (2002)		Health Care Cost*
	Deaths	AAMR	Count	AAIR	Count	AAPR	*(in millions)*
GEORGIA	6,612	20.3	9,763	44.3	14,599	181.0	905.1
Appling	22	26.8	22	41.3	33	183.7	2.0
Atkinson	8	–	13	61.6	18	250.1	1.1
Bacon	9	–	10	32.2	11	104.8	0.7
Baker	4	–	4	–	8	–	0.5
Baldwin	44	22.7	50	38.5	84	183.3	5.2
Banks	17	28.5	9	–	17	111.3	1.1
Barrow	37	21.0	42	35.9	54	115.4	3.3
Bartow	49	16.9	75	36.4	116	149.0	7.2
Ben Hill	28	30.1	32	60.7	40	233.6	2.5
Berrien	29	35.8	18	37.0	24	148.6	1.5
Bibb	209	26.7	368	79.8	467	305.0	29.0
Bleckley	6	–	12	32.9	19	160.9	1.2
Brantley	8	–	17	40.8	19	131.0	1.2
Brooks	27	26.6	23	42.8	41	239.7	2.5
Bryan	13	19.8	18	33.7	27	127.7	1.7
Bulloch	41	19.5	60	44.8	69	142.2	4.3
Burke	37	38.0	38	63.2	56	271.5	3.5
Butts	11	13.2	31	55.8	36	180.7	2.2
Calhoun	5	–	14	73.8	29	459.2	1.8
Camden	17	17.6	26	33.2	43	130.8	2.7
Candler	21	33.5	22	74.6	24	247.6	1.5
Carroll	54	14.6	108	44.4	132	149.1	8.2
Catoosa	31	12.8	37	22.5	50	86.7	3.1
Charlton	10	25.2	10	32.8	12	117.8	0.7
Chatham	239	20.5	350	50.1	531	227.5	32.9
Chattahoochee	4	–	5	–	16	345.1	1.0
Chattooga	28	19.5	29	34.4	56	203.7	3.5
Cherokee	55	13.5	98	30.4	128	91.6	7.9
Clarke	52	15.1	105	48.7	139	178.8	8.6
Clay	3	–	7	–	10	246.4	0.6
Clayton	166	26.9	267	55.8	442	221.2	27.4
Clinch	13	41.0	11	55.0	15	217.1	0.9
Cobb	322	18.7	409	28.9	655	113.2	40.6
Coffee	45	29.1	50	51.5	66	192.4	4.1
Colquitt	39	18.3	75	59.7	99	238.1	6.1
Columbia	55	17.8	66	30.8	103	120.3	6.4
Cook	21	25.9	22	45.7	29	183.0	1.8
Coweta	50	15.2	105	43.9	146	161.3	9.1
Crawford	14	30.6	14	43.4	20	173.3	1.2
Crisp	23	20.5	34	52.4	56	260.2	3.5
Dade	8	–	12	25.1	16	96.8	1.0
Dawson	6	–	9	–	14	75.5	0.9
Decatur	37	25.4	30	34.9	55	197.5	3.4
DeKalb	455	19.6	695	41.7	1,221	193.8	75.7
Dodge	22	21.9	28	48.8	38	202.5	2.4
Dooly	10	17.4	37	112.1	45	399.8	2.8
Dougherty	82	18.6	196	72.4	296	321.0	18.4
Douglas	65	23.2	93	40.3	135	148.4	8.4
Early	16	21.0	25	65.8	45	377.1	2.8
Echols	1	–	0	–	2	–	0.1
Effingham	29	24.8	32	35.0	37	104.1	2.3
Elbert	19	16.0	39	56.4	47	214.8	2.9
Emanuel	26	22.8	42	61.1	58	256.5	3.6
Evans	7	–	23	73.9	29	274.3	1.8
Fannin	18	12.7	17	20.0	24	101.9	1.5
Fayette	50	15.0	67	27.4	75	79.5	4.7
Floyd	82	16.8	71	24.9	120	128.8	7.4
Forsyth	59	21.0	59	27.3	60	66.7	3.7
Franklin	17	13.9	21	30.1	31	144.1	1.9
Fulton	809	26.9	1248	60.2	1,971	258.7	122.2
Gilmer	13	11.5	24	30.1	28	104.0	1.7
Glascock	4	–	8	–	6	–	0.4
Glynn	64	16.9	101	45.5	166	233.4	10.3
Gordon	52	28.1	32	25.4	59	130.0	3.7
Grady	37	29.1	39	54.2	44	187.9	2.7
Greene	23	26.5	26	53.2	45	280.1	2.8
Gwinnett	231	16.9	327	26.6	456	82.8	28.3
Habersham	30	15.6	29	24.9	41	106.9	2.5
Hall	97	18.7	114	31.0	169	120.5	10.5
Hancock	24	49.8	21	68.9	30	291.9	1.9
Haralson	28	21.3	28	34.4	35	129.9	2.2
Harris	13	11.8	20	27.3	27	106.5	1.7
Hart	26	18.7	26	31.6	24	96.4	1.5
Heard	8	–	12	37.9	15	136.0	0.9
Henry	69	18.3	129	43.3	195	164.4	12.1
Houston	75	18.1	115	38.6	159	147.2	9.9
Irwin	7	–	13	40.4	15	140.3	0.9
Jackson	44	24.7	50	40.7	67	151.7	4.2
Jasper	12	23.3	20	57.4	30	243.2	1.9
Jeff Davis	15	26.1	14	35.6	22	168.3	1.4
Jefferson	34	36.4	54	101.6	70	414.2	4.3
Jenkins	11	24.7	11	42.1	13	147.2	0.8
Johnson	12	24.2	15	54.4	24	279.2	1.5
Jones	23	22.3	19	26.9	30	119.8	1.9
Lamar	20	25.8	20	41.8	37	226.2	2.3
Lanier	8	–	9	–	14	201.8	0.9
Laurens	46	19.3	90	64.9	132	286.1	8.2
Lee	9	–	15	28.2	29	141.6	1.8

AAMR = age-adjusted mortality rate
AAIR = age-adjusted incidence rate
AAPR = age-adjusted prevalence rate
– Rates for counties with less than 10 events are not shown.

** Total health care cost is calculated based on $62,000 annual dialysis-related expense per patient obtained from the National Kidney Foundation of Georgia.*

Table 2. Age-adjusted kidney disease death rates and incidence, prevalence, and estimated health care costs for End-Stage Renal Disease (ESRD) by county, Georgia, 1999-2003. (continued)

County	Mortality (1999-2003)		End-Stage Renal Disease				
			Incidence (2000-2002)		Prevalence (2002)		Health Care Cost*
	Deaths	AAMR	Count	AAIR	Count	AAPR	*(in millions)*
Liberty	26	25.5	53	57.5	76	202.2	4.7
Lincoln	11	25.7	18	58.4	34	346.7	2.1
Long	4	–	7	–	11	139.8	0.7
Lowndes	93	27.3	148	66.0	207	250.5	12.8
Lumpkin	20	24.0	20	37.1	18	92.0	1.1
McDuffie	23	22.3	48	76.9	70	333.4	4.3
McIntosh	10	19.3	14	43.9	21	191.0	1.3
Macon	24	33.5	19	45.2	22	155.8	1.4
Madison	10	8.4	21	26.3	29	105.8	1.8
Marion	10	31.3	12	56.0	14	201.8	0.9
Meriwether	26	21.4	25	36.2	59	261.6	3.7
Miller	4	–	11	54.0	18	269.7	1.1
Mitchell	23	20.7	45	65.5	64	272.3	4.0
Monroe	23	26.9	31	50.2	49	222.8	3.0
Montgomery	8	–	6	–	11	146.2	0.7
Morgan	20	25.0	32	65.9	39	236.5	2.4
Murray	18	15.9	29	32.9	49	141.9	3.0
Muscogee	186	22.0	324	61.7	501	279.7	31.1
Newton	60	23.8	83	46.8	145	221.0	9.0
Oconee	15	14.9	17	26.6	15	62.1	0.9
Oglethorpe	12	19.7	8	–	14	102.2	0.9
Paulding	42	20.0	34	23.2	48	71.5	3.0
Peach	27	29.6	46	71.6	71	315.5	4.4
Pickens	15	12.8	25	32.1	23	87.6	1.4
Pierce	15	20.1	20	41.5	29	175.5	1.8
Pike	6	–	22	52.3	38	263.0	2.4
Polk	34	17.2	36	30.7	55	139.7	3.4
Pulaski	12	23.1	14	45.5	20	195.7	1.2
Putnam	23	24.3	22	34.1	31	141.8	1.9
Quitman	3	–	8	–	8	–	0.5
Rabun	22	23.2	17	31.7	25	141.4	1.6
Randolph	15	30.1	22	91.0	28	374.0	1.7
Richmond	205	24.1	405	74.2	613	323.5	38.0
Rockdale	36	13.5	69	36.4	94	135.6	5.8
Schley	4	–	1	–	7	–	0.4
Screven	18	21.8	25	53.6	41	268.6	2.5
Seminole	5	–	15	45.6	25	251.9	1.6
Spalding	64	23.4	99	58.0	125	213.4	7.8
Stephens	29	18.2	31	36.2	52	195.9	3.2
Stewart	14	38.7	12	65.8	16	293.3	1.0
Sumter	19	11.2	39	40.6	79	247.9	4.9
Talbot	13	36.8	13	55.3	18	227.0	1.1
Taliaferro	3	–	1	–	5	–	0.3
Tattnall	20	20.0	32	52.9	33	155.3	2.0
Taylor	12	25.8	8	–	21	242.6	1.3
Telfair	17	24.9	16	42.4	24	199.4	1.5
Terrell	13	22.1	30	90.7	61	569.2	3.8
Thomas	56	24.2	92	68.0	145	330.4	9.0
Tift	25	13.6	41	36.9	68	179.7	4.2
Toombs	33	25.4	40	52.7	51	199.6	3.2
Towns	16	18.6	18	36.9	19	168.3	1.2
Treutlen	7	–	15	76.3	20	305.7	1.2
Troup	80	26.9	105	60.5	146	250.2	9.1
Turner	9	–	7	–	12	125.3	0.7
Twiggs	19	43.5	20	63.3	32	301.7	2.0
Union	20	15.1	21	28.1	22	95.6	1.4
Upson	37	23.3	45	49.2	67	230.2	4.2
Walker	45	13.8	76	38.2	106	161.9	6.6
Walton	36	13.8	49	28.8	70	110.4	4.3
Ware	33	15.2	70	60.9	80	220.7	5.0
Warren	16	39.0	15	72.2	28	447.4	1.7
Washington	17	16.0	35	56.6	59	284.3	3.7
Wayne	22	18.6	40	50.9	61	222.1	3.8
Webster	4	–	1	–	7	–	0.4
Wheeler	4	–	9	–	7	–	0.4
White	20	18.3	12	17.5	16	70.3	1.0
Whitfield	41	12.3	86	37.4	112	136.4	6.9
Wilcox	3	–	14	52.4	19	214.0	1.2
Wilkes	14	19.6	19	49.3	35	302.2	2.2
Wilkinson	7	–	17	51.5	26	230.7	1.6
Worth	17	16.3	30	45.7	40	184.5	2.5

AAMR = age-adjusted mortality rate
AAIR = age-adjusted incidence rate
AAPR = age-adjusted prevalence rate
– Rates for counties with less than 10 events are not shown.

** Total health care cost is calculated based on $62,000 annual dialysis-related expense per patient obtained from the National Kidney Foundation of Georgia.*

Note:
Rate is calculated per 100,000 population. The 2000 U.S. standard population is used for age adjustment.

Sources:
1. Georgia Department of Human Resources, Division of Public Health, Office of Health Information & Policy (URL: http://health.state.ga.us).
2. The United States Renal Data System, Network 6.

Adverse outcomes of chronic kidney disease can often be prevented or delayed through early detection and treatment. Earlier stages of chronic kidney disease can be detected through routine laboratory examinations.

Get tested and find out your glomerular filtration rate

According to the National Kidney Foundation's Kidney Disease Outcomes Quality Initiative (NKF-K/DOQI) Clinical Practice Guidelines for Chronic Kidney Disease (CKD), there are five stages of CKD based on a person's glomerular filtration rate (GFR), the rate that indicates how fast the kidneys filter waste from one's blood. GFR can be estimated based on a person's blood creatinine level, height, weight, sex, race, and age.

Table 3. Stages of chronic kidney disease and estimated number of Georgians with chronic kidney disease, Georgia, 2000

Stage	GFR[1]	Description	Estimated No. of cases[2]
1	≥90	Kidney damage[3] with normal or increased GFR	270,000
2	60-89	Kidney damage[3] with a mild decrease in GFR	246,000
3	30-59	Moderate decrease in GFR	352,000
4	15-29	Severe decrease in GFR	16,000
5	<15 or on dialysis	Kidney failure	14,000

1 = glomerular filtration rate measured in mL/min/1.73 m^2.
2 = based on the 2000 Georgia population estimates and the NHANES III results.
3 = kidney damage is defined as pathologic abnormalities or markers of damage, including abnormalities in blood or urine tests or imaging studies.

Source: The National Kidney Foundation of Georgia, chronic kidney disease patient estimates by stage for Georgia, 2000.

Each stage of CKD includes a range of GFRs. The lower the GFR, the weaker the kidneys' ability to filter waste from one's blood, and the higher the severity of CKD. Persons with GFR less than 15 are in Stage 5, and they are considered to have chronic kidney failure or loss of kidney function. In Stage 5, a patient's survival depends on dialysis or kidney transplantation, and persons in this category are diagnosed with end-stage renal disease (ESRD). In addition to about 14,000 Stage 5 CKD or ESRD patients in Georgia in 2000, the National Kidney Foundation of Georgia estimated that there were approximately 884,000 Georgians living with CKD of Stages 1 through 4 (*Table 3*).

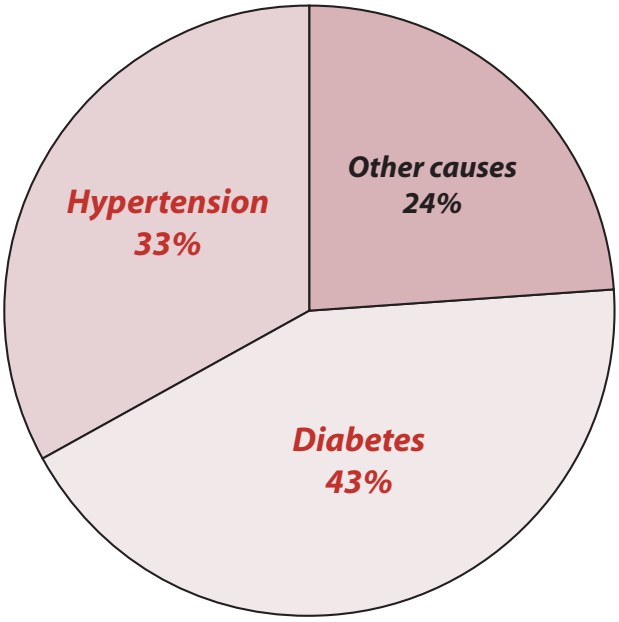
Preventing common risk factors for the development of end-stage renal disease

Diabetes and hypertension are the two most common causes of ESRD, and both of them are modifiable conditions (3, 4). Physicians in Georgia reported that there were 3,302 newly diagnosed ESRD patients in 2002 (5). Of them, 76% had either diabetes (43%) or

Individuals with hypertension should monitor their blood pressure, and those with diabetes should monitor their blood sugar levels on a regular basis.

hypertension (33%) as the primary cause of their ESRD (*Figure 10*). Diabetes was the cause of ESRD for 43% of both blacks and whites, whereas hypertension was a slightly more common cause for blacks (36%) than for whites (29%).

Figure 10. Primary causes of ESRD, Georgia, 2002



In many instances, both hypertension and diabetes can be prevented. Even if not prevented, they can be controlled. For many people, maintaining a normal body weight and being sufficiently physically active can prevent diabetes and hypertension. For some people, limiting alcohol consumption also can help prevent hypertension (6) and may even reduce the risk for ESRD (7). Preventing these two conditions, diabetes and hypertension, will greatly reduce the risk of developing ESRD.

Hypertension and diabetes, if they do occur, can be controlled by modifying lifestyles according to behavioral recommendations and by the use of appropriate medications. Individuals with hypertension should monitor their blood pressure, and those with diabetes should monitor their blood sugar levels on a regular basis. People living with either disease should adhere to the diet, physical activity level, and medications prescribed by their physician.

Medications such as angiotensin-converting enzyme (ACE) inhibitors or angiotensin receptor blockers (ARBs) can slow down the progression of kidney disease and delay the development of kidney failure (1, 6, 8). These drugs may be prescribed for persons with hypertension or diabetes. Individuals with a family history of kidney disease or ESRD should also see their physician for periodic evaluation and possible prescription of these drugs.

The People at Risk. The Power to Prevent.

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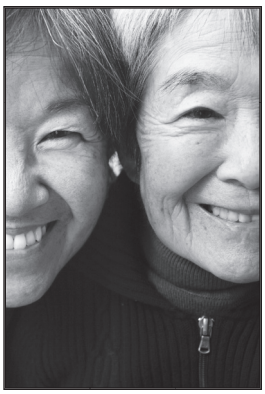

Appendix

Methods, Glossary, and Abbreviations

Methods

Age-adjusted mortality rates

Age-adjusted mortality rates for the U.S. from 1980 through 2002 and for Georgia from 1980 through 1993 were obtained via CDC WONDER at http://wonder.cdc.gov from the compressed mortality file complied by the National Center for Health Statistics, CDC. Age-adjusted mortality rates for Georgia from 1994 through 2002 were obtained via OASIS (On-line Analytical Statistical Information System) at http://health.state.ga.us provided by the Office of Health Information and Policy, Georgia Division of Public Health. Age-adjusted mortality rates for counties were also obtained from the OASIS. The number of deaths due to kidney disease prior to 1999 was determined using the International Classification of Diseases, 9th Revision (ICD-9) codes 580-589. The number of deaths for 1999 and after was determined using the International Classification of Diseases, 10th Revision (ICD-10) codes N00-N07, N17-N19, and N25-N27.

Age-adjusted ESRD incidence rates

The incidences of ESRD for the U.S. and Georgia (including county-level data) from 1980 through 2002 were calculated using Standard Analysis Files (SAF) requested from the United States Renal Data System (USRDS). The incidence of ESRD was defined as the number of new patients treated by dialysis or kidney transplantation, whose records are registered, classified, stored and maintained in the USRDS in a given calendar year. Age-adjusted rates were computed using the direct method based on the population estimates obtained from the U.S. Bureau of the Census. The 2000 U.S. standard population was used as the standard. Further information on USRDS data sources can be found at http://www.usrds.org.

Age-adjusted ESRD prevalence rates

The prevalence of ESRD for the U.S. and Georgia (including county-level data) from 2000 through 2002 was calculated using Standard Analysis Files (SAF) requested from the United States Renal Data System (USRDS). The prevalence of ESRD was defined as the total number of reported ESRD patients recorded in the USRDS as of December 31 for a given calendar year. Age-adjusted prevalence rates were computed using the direct method based on the population estimates obtained from the U.S. Bureau of the Census. The 2000 U.S. standard population was used as the standard.

Primary causes of ESRD

Data on the primary causes of ESRD were obtained using the Standard Analysis Files described above. Percentages were calculated using the primary cause of renal failure as noted by the attending physician.

Underlying cause of death

The underlying cause of death, as defined by the World Health Organization, is the disease or injury that initiated the sequence of events leading directly to death, or the circumstances of the accident or violence that caused the fatal injury. In this report, the number of deaths due to kidney disease was counted based on the underlying cause of death.

Age-adjusted mortality rate: a rate calculated based on a standard age distribution to enable comparison of rates in populations with different age structures.

Chronic kidney disease: the presence of kidney damage or decreased level of kidney function for three months or more, irrespective of diagnosis. In this report, it specifically refers to certain types of kidney diseases: nephritis, nephrotic syndrome, and nephrosis.

Diabetes: a chronic disorder of metabolism affecting the way the body uses digested food for growth and energy.

Dialysis: the process by which metabolic waste products are removed by cleansing of the blood directly through extracorporeal filtration membranes (hemodialysis) or indirectly by diffusion of waste products through the peritoneal membranes into instilled fluids (peritoneal dialysis).

End-stage renal disease (ESRD): chronic renal failure requiring either dialysis or a kidney transplant to sustain life.

Glomerular filtration rate (GFR): a calculated measurement that indicates how well a person's kidney functions. It may be estimated from one's blood level of creatinine.

Hypertension: High blood pressure. A medical condition in which constricted arterial blood vessels increase the resistance to blood flow, causing an increase in blood pressure exerted on vessel walls.

Incidence: the number of new cases of disease occurring in a specific population over a specific period of time, usually one year.

Prevalence: the number of persons with a disease or an attribute at a specified time.

Risk factor: a habit, characteristic, or finding on clinical examination that is associated with an increased probability of having a particular disease.

Serum creatinine: a waste product in a person's blood that comes from muscle activity. It is normally removed from one's blood by the kidneys; however, when kidney function slows down, the creatinine level rises.

Abbreviations

AAMR = Age-adjusted mortality rate
ACE = Angiotensin-converting enzyme inhibitor
ARB = Angiotensin receptor blocker
CDC = Centers for Disease Control and Prevention
CKD = Chronic kidney disease
ESRD = End-stage renal disease
GFR = Glomerular filtration rate
ICD-9 = The International Classification of Diseases, 9th Revision
ICD-10 = The International Classification of Diseases, 10th Revision
NCHS = The National Center for Health Statistics
OASIS = On-line Analytical Statistical Information System
SAF = Standard Analysis Files
USRDS = The United States Renal Data System

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