

Primary Diagnosis

The kidneys are two bean-shaped organs about the size of a fist, which are located in the middle of the back, one on each side of the spine just below the rib cage. Although the kidneys are small organs by weight, they receive 20–25% of the total arterial blood pumped by the heart. The large blood supply to the kidneys enables them to cleanse the blood by filtering out excess water and waste products and producing hormones that regulate blood pressure and keep bones strong. The kidneys also regulate the body's salt and potassium levels, stimulate the making of red blood cells, and maintain the body's calcium levels. This section presents information on the primary diagnoses and patient characteristics of the KHC *incident population*.*

Kidney failure is divided into two classifications. **Acute kidney failure** is most likely to occur after infection, complicated surgery or a severe injury, or when blood vessels leading to the kidneys become blocked. In most cases, full kidney function can be restored. **Chronic, or permanent kidney failure**, also known as ESRD, usually develops slowly over a period of years, with few signs or symptoms in the early stages. ESRD is the clinical condition resulting from a number of pathologic processes that lead to diminished renal reserve or complete renal insufficiency (renal failure), and requires dialysis or transplantation to perform the functioning of the failed kidneys. Medical conditions and diseases, congenital malformations, and injuries can also render the kidneys incapable of performing their life-sustaining functions.

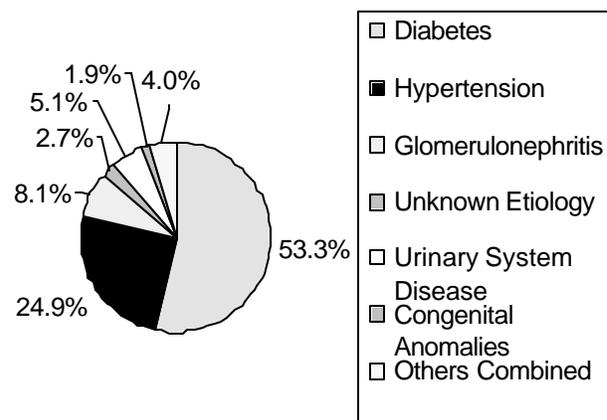
Diabetes is the most common cause of kidney failure, both in Texas and in the United States. Diabetes is a disease in which the pancreas does not produce enough insulin or cannot efficiently use the insulin that is produced. Insulin is a hormone that regulates the amount of glucose in the blood.

*The KHC *incident population* refers to new applicants approved for program benefits during the fiscal year being reported.

Without insulin, the body is unable to convert glucose to energy, leaving large amounts of sugar in the blood stream, which can slowly damage the filtering membranes in the kidneys. A scar-like material builds up on the capillary walls of the glomeruli where filtering takes place, which impairs kidney function. Diabetes can also lead to other co-morbid conditions such as diabetic neuropathy (peripheral nerve damage) and cardiovascular disease, the latter being the predominant cause of death in patients with ESRD.

Hypertension, or high blood pressure, is the second leading cause of kidney failure, both in Texas and in the United States. Hypertension is a disease in which the constriction of blood vessels reduces the supply of blood to the kidneys, and over years, damages the working units (nephrons) of the kidneys. High blood pressure makes the heart work harder, and over time can damage the blood vessels throughout the body. When the blood vessels in the kidneys become damaged, they stop doing their job of removing wastes and extra fluid from the blood. The extra fluid may then raise blood pressure even more.

Figure 8:
Primary Diagnosis of FY04 Applicants



Kidney Health Care

Glomerulonephritis, the third leading cause of ESRD for KHC approved applicants, is a group of diseases caused by inflammation and destruction of the glomeruli, the blood filtering structures in the nephrons. *Acute glomerulonephritis* is characterized by a rapid loss of kidney function, and is usually the result of an immune response to a bacterial infection. Nephrologists can successfully treat this form of glomerulonephritis with antibiotic therapy.

Chronic glomerulonephritis is the advanced stage of a group of kidney disorders, and results in inflammation and a gradual, progressive destruction of the glomeruli. Some cases are caused by specific stimuli to the immune system, but the precise cause of most cases is unknown. Currently, there is no cure for this chronic form of glomerulonephritis.

Diabetes was the leading cause of ESRD for KHC approved applicants in FY04, comprising 53.3% of new cases (Figure 8). Ten years ago, applicants with this primary diagnosis made up 46.4% of new cases. Diabetes has been the most common cause of chronic renal failure in the KHC incident population since FY82.

In FY04, 25% of KHC approved applicants had a primary diagnosis of hypertension, a decrease of 4% from FY94. KHC has seen consistent patterns over the years of hypertension being the second

leading cause of renal failure in KHC approved applicants. Diabetes and hypertension are listed as the primary causes of ESRD in 78% of KHC incident patients.

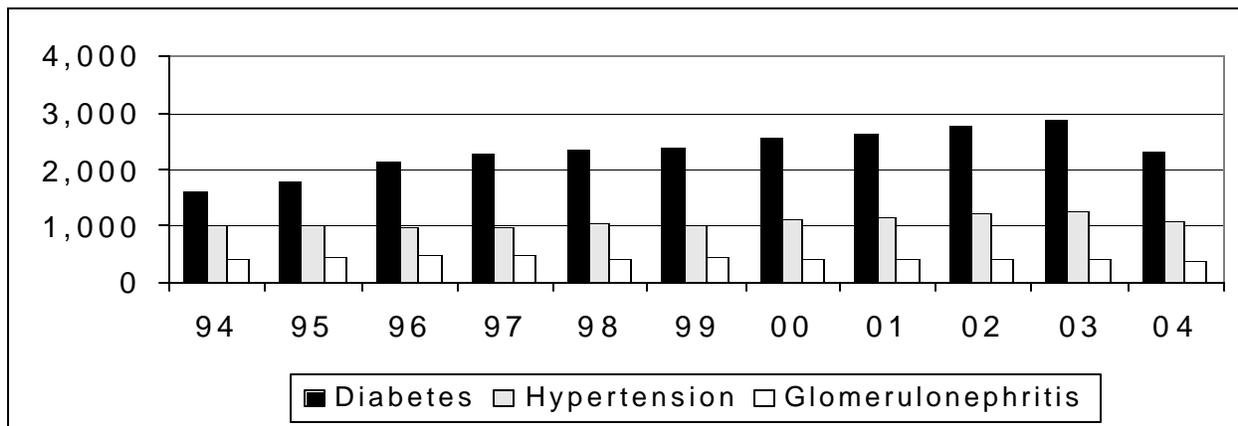
In FY04, 8.1% of the KHC incident population had a primary diagnosis of glomerulonephritis, a decrease of 4% from the percentage of FY94 applicants with this diagnosis.

After diabetes, hypertension, and glomerulonephritis, the most common primary diagnoses in FY04 were urinary system disease, unknown etiology, and congenital anomalies. Urinary system disease includes interstitial nephritis (a disease that affects the bladder), urinary tract infections, kidney stones, and other disorders of the urinary system. Congenital anomalies include cystic disorders of the kidney such as polycystic kidney disease, medullary cystic kidney disease, and other disorders such as renal calculi, Alport's syndrome, and tuberous sclerosis.

Figure 9 shows the leading primary diagnoses for KHC applicants between FY94 and FY04. Diabetes has remained the leading primary diagnosis for all years depicted.

For detailed information on primary diagnoses, please refer to the tables on page 20 in this section.

Figure 9: Leading Primary Diagnoses FY94-FY04



As of 10/05/04, ASKIT.

Primary Diagnosis by Age

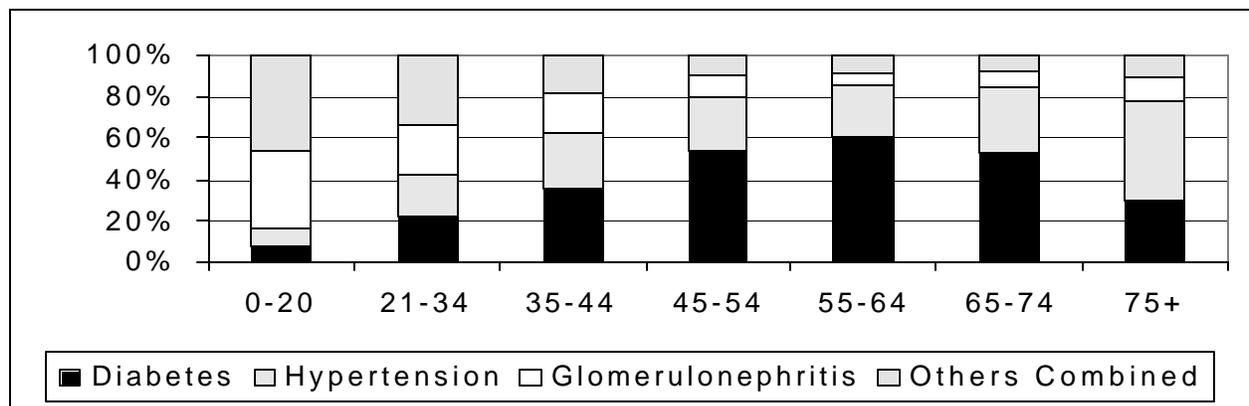
When looking at FY04 primary diagnosis by age, diabetes is the leading cause of ESRD among KHC applicants who are age 35 and over. Among applicants under the age of 21 at the time of entry into the program, glomerulonephritis was the most common cause of kidney failure. Hypertension was the leading cause of ESRD among applicants in the 21-34 age group.

In FY94, similar trends were seen with diabetes as the leading primary diagnosis for most age groups, with the exception of those applicants in the 0-21 and 21-34 age groups, in which glomerulonephritis was the leading primary diagnosis.

Figure 11 shows that KHC applicants in the 55-64 age group have the highest percent of ESRD due to diabetes, comprising 67% of cases within that age category.

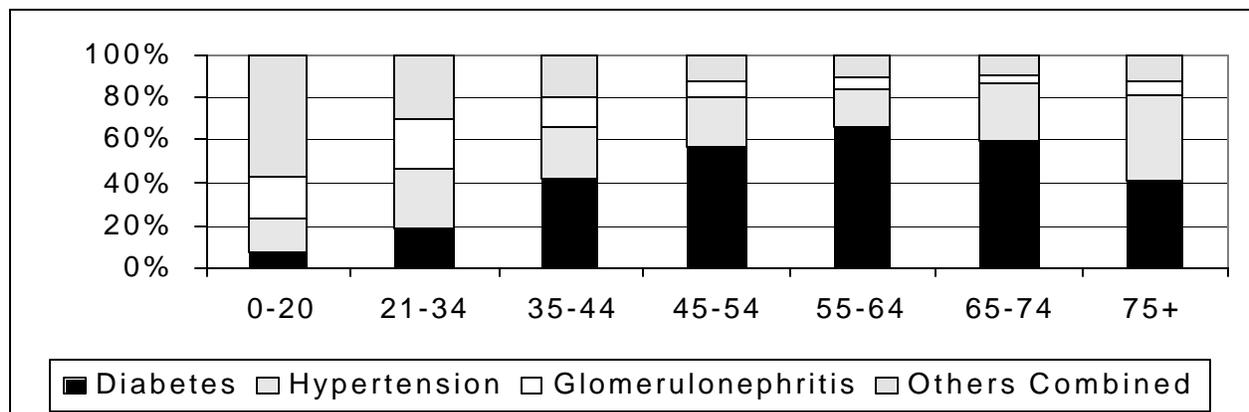
In FY04, hypertension comprised 25% of new applicants and was highest in applicants within the 75+ age group. It is important to note that in FY94, diabetes as a primary diagnosis comprised 30% of applicants within the 75+ age group -- hypertension comprised 48.4% of applicants within this group. In FY04, diabetes as a primary diagnosis comprised 40.3% of applicants within the 75+ age group, and applicants with hypertension comprised 40.7% of applicants in this same group.

Figure 10: Primary Diagnosis by Age, FY94



As of 10/05/04, ASKIT.

Figure 11: Primary Diagnosis by Age, FY04



As of 10/05/04, ASKIT.

Kidney Health Care

Table 10: Primary Diagnosis by Age, FY94

Primary Diagnosis	0-20		21-34		35-44		45-54		55-64		65-74		75+		Total	
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
Diabetes	5	7.5	71	21.7	155	35.6	330	53.7	508	60.7	443	53.3	123	29.9	1635	46.4
Hypertension	6	9.0	70	21.4	117	26.8	165	26.8	209	25.0	256	30.8	199	48.4	1022	29.0
Glomerulo-nephritis	25	37.3	78	23.9	89	20.4	62	10.1	54	6.5	68	8.2	46	11.2	422	12.0
Unknown Etiology	7	10.4	27	8.3	21	4.8	12	2.0	17	2.0	19	2.3	8	1.9	111	3.1
Congenital Anomalies	12	17.9	11	3.4	17	3.9	20	3.3	16	1.9	18	2.2	7	1.7	101	2.9
Urinary System Disease	3	4.5	17	5.2	10	2.3	4	0.7	12	1.4	15	1.8	15	3.6	76	2.2
Connective Tissue Disease	4	6.0	36	11.0	13	3.0	15	2.4	5	0.6	3	0.4	3	0.7	79	2.2
Malignant Neoplasm	0	0.0	1	0.3	1	0.2	3	0.5	11	1.3	7	0.8	10	2.4	33	0.9
HIV/AIDS	0	0.0	10	3.1	5	1.1	2	0.3	1	0.1	0	0.0	0	0.0	18	0.5
Metabolic Disease	1	1.5	1	0.3	0	0.0	1	0.2	1	0.1	0	0.0	0	0.0	4	0.1
Blood Diseases	1	1.5	0	0.0	3	0.7	0	0.0	2	0.2	0	0.0	0	0.0	6	0.2
Other	3	4.4	5	1.4	5	1.2	1	0.0	1	0.2	2	0.2	0	0.2	17	0.5
Total	67	100	327	100	436	100	615	100	837	100	831	100	411	100	3524	100

As of 10/05/2005, ASKIT.

Table 11: Primary Diagnosis by Age, FY04

Primary Diagnosis	0-20		21-34		35-44		45-54		55-64		65-74		75+		Total	
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
Diabetes	3	7.5	59	19.2	207	42.0	549	57.5	743	66.9	520	59.8	221	40.3	2302	53.3
Hypertension	6	15.0	86	28.0	123	24.9	219	22.9	189	17.0	230	26.4	223	40.7	1076	24.9
Glomerulo-nephritis	8	20.0	69	22.5	66	13.4	69	7.2	64	5.8	40	4.6	33	6.0	349	8.1
Unknown Etiology	6	15.0	20	6.5	19	3.9	28	2.9	10	0.9	13	1.5	19	3.5	115	2.7
Congenital Anomalies	7	17.5	9	2.9	17	3.4	26	2.7	14	1.3	6	0.7	2	0.4	81	1.9
Urinary System Disease	7	17.5	28	9.1	29	5.9	30	3.1	56	5.0	41	4.7	30	5.5	221	5.1
Connective Tissue Disease	2	5.0	23	7.5	12	2.4	9	0.9	4	0.4	1	0.1	1	0.2	52	1.2
Malignant Neoplasm	0	0.0	2	0.7	3	0.6	6	0.6	14	1.3	12	1.4	10	1.8	47	1.1
HIV/AIDS	0	0.0	5	1.6	11	2.2	10	1.0	0	0.0	0	0.0	0	0.0	26	0.6
Metabolic Disease	0	0.0	3	1.0	2	0.4	3	0.3	5	0.5	3	0.3	1	0.2	17	0.4
Blood Diseases	0	0.0	0	0.0	0	0.0	2	0.2	2	0.2	1	0.1	0	0.0	5	0.1
Other	1	2.5	3	1.0	4	0.9	4	0.7	9	0.7	3	0.4	8	1.4	32	0.6
Total	40	100	307	100	493	100	955	100	1110	100	870	100	548	100	4323	100

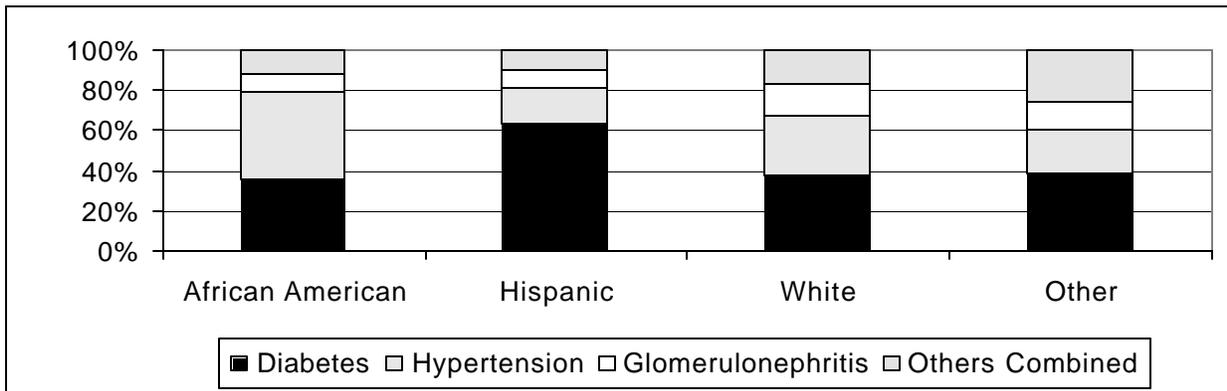
As of 10/05/2005, ASKIT.

Primary Diagnosis by Ethnic Group

The distribution of ESRD among KHC approved applicants reveals increased growth in diabetes as a primary diagnosis among all ethnic groups between FY94 and FY04. Most notable is the percentage of FY04 applicants within the Hispanic group whose kidneys failed due to diabetes (68.7%). This percentage has increased from FY94, when 63.5% of Hispanics approved for KHC benefits had this primary diagnosis. In FY04, the percentage of approved applicants with this primary diagnosis in the KHC general population was 53.3%.

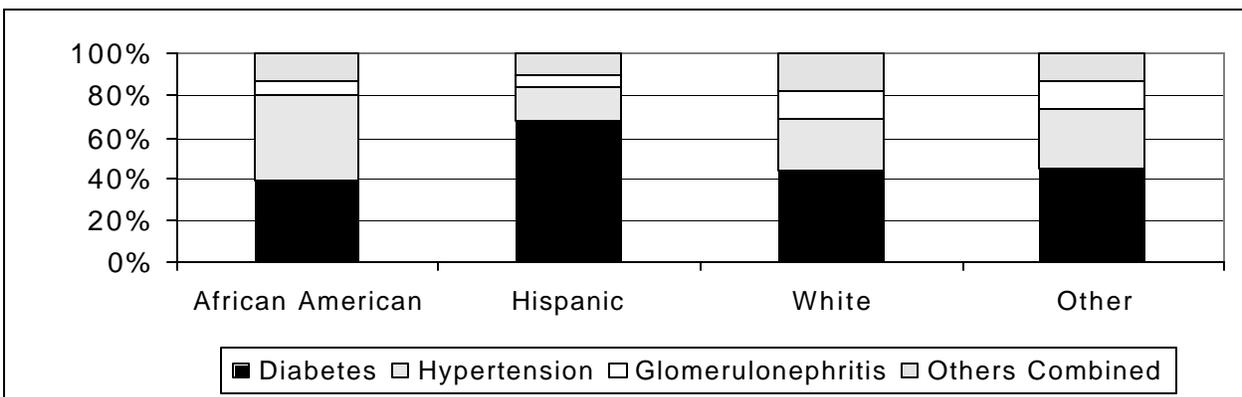
While Hispanics are disproportionately affected by diabetes as a primary diagnosis of ESRD, African American applicants on the KHC program are disproportionately affected by hypertension. Hypertension as a primary diagnosis accounted for 40% of all FY04 applicants within this ethnic group.

Figure 12: Primary Diagnosis by Ethnic Group, FY94



As of 10/05/04, ASKIT.

Figure 13: Primary Diagnosis by Ethnic Group, FY04



As of 10/05/04, ASKIT.

Kidney Health Care

Table 12: Primary Diagnosis by Ethnic Group, FY94

Primary Diagnosis	African American		Hispanic		White		Other		Total	
	Count	%	Count	%	Count	%	Count	%	Count	%
Diabetes	327	35.4	798	63.5	484	38.0	26	38.2	1,635	46.4
Hypertension	407	44.0	228	18.1	372	29.2	15	22.1	1,022	29.0
Glomerulonephritis	89	9.6	119	9.5	204	16.0	10	14.7	422	12.0
Unknown Etiology	27	2.9	39	3.1	38	3.0	7	10.3	111	3.1
Congenital Anomalies	9	1.0	19	1.5	70	5.5	3	4.4	101	2.9
Urinary System Disease	9	1.0	17	1.4	45	3.5	5	7.4	76	2.2
Connective Tissue Disease	29	3.1	24	1.9	24	1.9	2	2.9	79	2.2
Malignant Neoplasm	7	0.8	6	0.5	20	1.6	0	0.0	33	0.9
HIV/AIDS	17	1.8	0	0.0	1	0.1	0	0.0	18	0.5
Metabolic Disease	0	0.0	1	0.1	3	0.2	0	0.0	4	0.1
Blood Diseases	3	0.3	2	0.2	1	0.1	0	0.0	6	0.2
Other	1	0.1	4	0.2	12	0.9	0	0.0	17	0.5
Total	925	100	1,257	100	1,274	100	68	100	3,524	100

As of 9/01/2004, ASKIT.

Table 13: Primary Diagnosis by Ethnic Group, FY04

Primary Diagnosis	African American		Hispanic		White		Other		Total	
	Count	%	Count	%	Count	%	Count	%	Count	%
Diabetes	456	39.8	1,221	68.7	575	44.6	50	45.5	2,302	53.3
Hypertension	459	40.1	266	15.0	320	24.8	31	28.2	1,076	24.9
Glomerulonephritis	80	7.0	97	5.5	158	12.2	14	12.7	349	8.1
Unknown Etiology	15	1.3	54	3.0	45	3.5	1	0.9	115	2.7
Congenital Anomalies	10	0.9	29	1.6	41	3.2	1	0.9	81	1.9
Urinary System Disease	47	4.1	68	3.8	98	7.6	8	7.3	221	5.1
Connective Tissue Disease	22	1.9	21	1.2	6	0.5	3	2.7	52	1.2
Malignant Neoplasm	15	1.3	10	0.6	22	1.7	0	0.0	47	1.1
HIV/AIDS	22	1.9	3	0.2	1	0.1	0	0.0	26	0.6
Metabolic Disease	3	0.3	3	0.2	10	0.8	1	0.9	17	0.4
Blood Diseases	5	0.4	0	0.0	0	0.0	0	0.0	5	0.1
Other	11	1.0	6	0.2	14	1.0	1	0.9	32	0.6
Total	1,145	100	1,778	100	1,290	100	110	100	4,323	100

As of 9/01/2004, ASKIT.

Primary Diagnosis by Gender

Table 14 and Figure 14 report on primary diagnosis by gender. There are several differences to note regarding the distribution of ESRD by gender. For example, the percentage of female applicants with a primary diagnosis of diabetes is higher than that of males, but male applicants with a primary

diagnosis of hypertension continue to outnumber females.

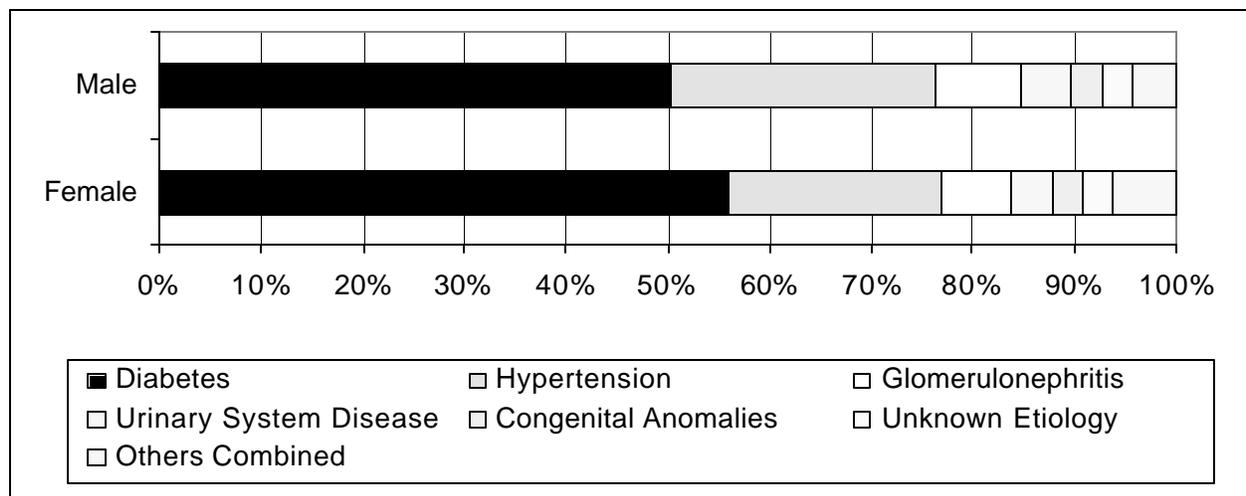
In FY04, male applicants experienced a 29% greater difference in urinary system disease versus females, and females experienced an 81% greater difference of connective tissue disease than males.

Table 14: Primary Diagnosis by Gender, FY04

Primary Diagnosis	Female	% Total	Male	% Total	Total	% Total
Diabetes	1,072	56.0	1,230	51.0	2,302	53.3
Hypertension	430	22.5	646	26.8	1,076	24.9
Glomerulonephritis	133	7.0	216	9.0	349	8.1
Unknown Etiology	49	2.6	66	2.7	115	2.7
Congenital Anomalies	38	2.0	43	1.8	81	1.9
Urinary System Disease	92	4.8	129	5.4	221	5.1
Connective Tissue Disease	44	2.3	8	0.3	52	1.2
Malignant Neoplasm	18	0.9	29	1.2	47	1.1
HIV/AIDS	6	0.3	20	0.8	26	0.6
Metabolic Disease	8	0.4	9	0.4	17	0.4
Blood Disease	3	0.2	2	0.1	5	0.1
Other	20	1.0	12	0.5	32	0.6
Total	1,913	100	2,410	100	4,323	100

As of 10/01/2004, ASKIT.

Figure 14: Primary Diagnosis by Gender, FY04



Primary Diagnosis Trends

Figure 15 illustrates trends in KHC primary diagnoses, and shows that an increase in the growth of KHC applicants with a primary diagnosis of diabetes has occurred over the 10-year period. In FY94, there were 1,635 diabetic applicants, or 46.4% of the KHC incident population. In FY04, that number increased to 2,302 applicants, or 53.3% of the KHC incident population.

of cases in 1994, and increased to 43,922 patients, or 45% in 2002. Both state and national data reflect the continuing incidence of diabetes.

It should be noted that the percentage of KHC applicants with a primary diagnosis of diabetic nephropathy is consistently higher than the national average for all years reported, which may be due to the high incidence of diabetes among the KHC general population, and particularly within the Hispanic group.

Figure 16 illustrates the growth of the diabetic ESRD population on a national level. Diabetes as a primary diagnosis accounted for 25,433 patients, or 38%

Figure 15: KHC Trends in Primary Diagnoses, FY94-FY04

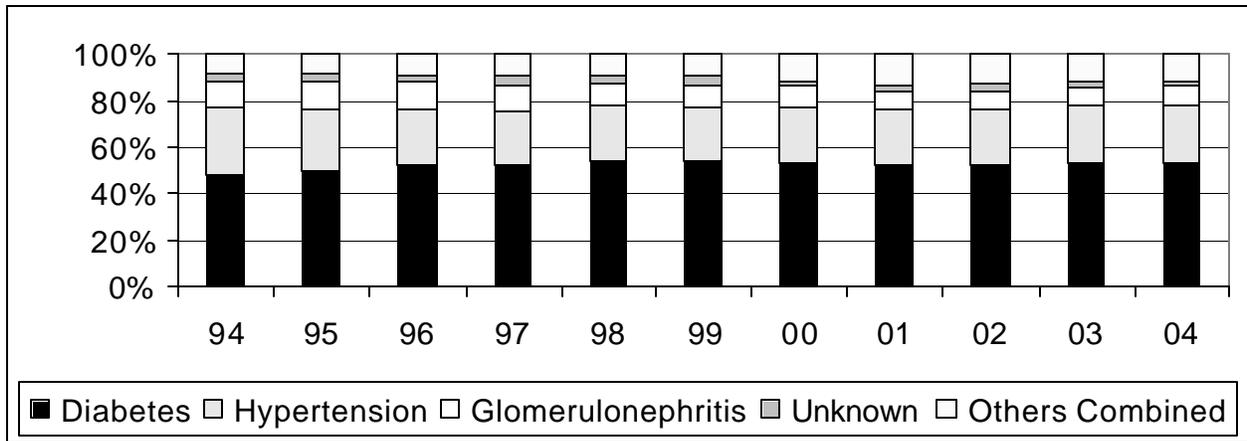


Figure 16: National Trends in Primary Diagnoses, 1994-2002
Source: United States Renal Data System 2004 Annual Data Report

