This is the urgency: Live!
and have your blooming in the noise of the whirlwind.

Gwendolyn Brooks
“The Second Sermon on the Warland”
Healthy People 2010 is a set of national health objectives designed to increase life expectancy, improve quality of life, and eliminate health differences among populations. The program presents goals for ten leading healthcare indicators and 28 focus areas; one of these areas is chronic kidney disease (CKD).

HP2010 sets an overall goal of reducing “new cases of CKD and its complications, disability, death, and economic costs,” and its CKD-related objectives respond to significant disparities in healthcare, to the growing costs of the ESRD program, and to the continued increase in the number of new ESRD patients. Achieving these objectives is no small task, as there are an estimated 20 million individuals in the U.S. with CKD.

Not all HP2010 objectives related to CKD can be evaluated using data routinely collected by CMS or the USRDS. Data for the eight objectives we are able to address show that no target is close to being achieved, and for many objectives we have in fact moved further away from those targets in the last several years.

The number of new cases of ESRD, for instance, continues to rise, and the rate of 333 per million population in 2002 is far above the HP2010 target of 217. The incident rate appeared to be stabilizing between 1999 and 2001, but it rose by 1.5 percent from 2001 to 2002.

Although it is encouraging to note that rates of increase in diabetic ESRD have slowed, the projected growth of diabetes in the general population suggests future growth in the number of patients whose ESRD is caused by diabetes. Diabetes prevention programs should continue to target all populations—particularly minorities, who have high rates of ESRD caused by diabetes, and obese individuals, who have a high risk of Type 2 diabetes.

Cardiovascular death rates remained fairly stable in the mid-1990s, increased 2 percent from 2000 to 2001, and then declined 3 percent from 2001 to 2002. The 2002 rate of 87.8 deaths per 1,000 patient years at risk remains well above the HP2010 target of 52. Rates of mortality due to cardiovascular disease have risen more quickly since 1991 than those of all-cause mortality. Because it remains the leading cause of death in ESRD patients, cardiovascular disease should be an area of major focus for intervention in CKD patients.

The HP2010 goal related to vascular access sets a target of 50 percent of new hemodialysis patients using arteriovenous (AV) fistulas as their primary mode of vascular access. Because it is difficult to determine a patient’s initial access from Medicare claims records, we use data from the Clinical Performance Measures (CPM) project. In 2001, only 30 percent of patients in the CPM data had an AV fistula, down from 35 percent in the previous year.
Vaccination rates in U.S. toddlers have increased tremendously, while attempts to improve rates in adult populations have been less successful (for details, see the HP2010 website at www.healthypeople.gov). In 2002, an estimated 66 percent of U.S. adults age 65 and older received an influenza vaccination, compared to 54 percent of ESRD patients. This is an increase over the 47 percent of ESRD patients vaccinated in 2001, so rates may be moving toward the HP2010 target of 90 percent, but more data are needed to determine if this is so.

HP2010 recommends that 90 percent of adults receive a pneumococcal pneumonia vaccination during their lives, a target met by an estimated 56 percent of U.S. adults over age 65. Guidelines of the Advisory Committee on Immunization Practices suggest that CKD patients receive an initial vaccination and a revaccination every six years. To have 90 percent of ESRD patients vaccinated every six years, 30 percent must be vaccinated every two years. In 2001–2002, however, vaccinations were given to only 11.8 percent. These dismal statistics point out that ESRD providers clearly need to incorporate vaccination programs into their unit protocols.

The percent of patients on the kidney transplant waiting list or who received a transplant within one year of initiation of therapy grew slightly in 2002, but at 16 percent still falls severely short of the HP2010 target of 66 percent. The percent of patients transplanted within three years of initiation continues to fall, particularly among blacks and Asians.

The American Diabetes Association (ADA) recommends that diabetic patients receive 2–4 glycosylated hemoglobin (HbA1c) tests per year, as well as annual lipid and eye examinations. Between 1997 and 2002 the percent of diabetic general Medicare and pre-ESRD patients receiving all three tests grew from 21.2 to 42.5 and from 19.3 to 37.3, respectively. The majority of pre-ESRD patients, however, still do not receive optimal monitoring, and 2002 rates remained below those of the general Medicare population. The rate of ESRD due to diabetes can be reduced through better adherence to ADA guidelines on diabetes management, including improved evaluation and management of CKD patients with diabetes.

We hope that information showing progress—and the lack of progress—toward HP2010 goals helps increase awareness of issues related to CKD, and promotes changes in the healthcare system to improve patient care. CKD is a common, costly, and preventable public health problem, underdiagnosed and undertreated. Several programs are currently working to reach people at risk, and to give providers guidance in treating them. The Kidney Early Evaluation Program (KEEP) of the National Kidney Foundation (NKF), for example, identifies and screens people at high risk for CKD. Through its Kidney Disease Outcomes and Quality Initiative (K/DOQI), NKF also presents clinical practice guidelines. And the National Kidney Disease Education Program, a program of the National Institutes of Health, centers its work around the crucial goals of education, prevention, early detection and treatment, and patient empowerment.

Progress toward the HP2010 goals will be made through the work of such programs: targeting CKD screening programs at high-risk populations, educating providers about the relationship between CKD and cardiovascular disease, and bringing nephrologists and primary care physicians together to optimize care.
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HP2010 Objective 4.4: Reduce the rate of new cases of end-stage renal disease

While the adjusted incident rate of ESRD has increased less than 2 percent in each of the last three years, there is no indication that it will begin to fall, and the 2002 rate of 333 cases per million population remains far from the HP2010 target of 217 (Table hp.a and Figure hp.2).

Since 1992 the overall incident rate has increased 36 percent; rates for the youngest patients, however, have remained stable, while those for patients age 75 and older have almost doubled (Figure hp.3). ESRD continues to disproportionately affect people of color. The 2002 rate for whites was 256 per million population; the rate for Hispanic patients, in contrast, was 481, and the rate for blacks reached nearly 1,000.

Rates of ESRD caused by glomerulonephritis have been stable since 1992, while the rate of diabetic ESRD has increased 68 percent (Figure hp.4).

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**Table hp.a** Incident ESRD patients; rates by age and race/ethnicity adjusted for gender & race, rates by gender adjusted for age & race, & rates by race & ethnicity adjusted for age & gender. Rates for non-Hispanics are unadjusted.

* Census data are not available for non-Hispanic blacks & whites, so rates cannot be calculated. (Figure hp.2) incident ESRD patients; adjusted for age, gender, & race. (Figure hp.3) incident ESRD patients; rates by age adjusted for gender & race, rates by race & ethnicity adjusted for age & gender. (Figure hp.4) incident ESRD patients; rates adjusted for age, gender, & race. Data on the prevalence of diabetes in the general population obtained from the CDC’s Behavioral Risk Factor Surveillance System. — For Hispanic patients we present data beginning in 1996, the first full year after the April 1995 introduction of the revised Medical Evidence form, which contains more specific questions on race & ethnicity.

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**Figure hp.2** Adjusted ESRD incident rates

**Figure hp.3** Adjusted ESRD incident rates, by age & race/ethnicity

**Figure hp.4** Adjusted ESRD incident rates, by primary diagnosis, & diabetes in the general population

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The 2000 U.S. Census allowed respondents to identify themselves by more than one race designation, which resulted in a higher number of self-designated Native Americans. This increased denominator explains the apparent fall in ESRD rates for Native Americans.
# HP2010 Objective 4.2: Reduce deaths from cardiovascular disease in persons with chronic kidney failure

Following a 2 percent rise between 2000 and 2001, rates of cardiovascular mortality decreased 3 percent in 2002, but, at 88 deaths per 1,000 patient years at risk, continue to remain well above the goal of 52 (Table hp.b and Figure hp.5). Compared to all-cause mortality rates, cardiovascular mortality rates show a slightly higher increase between 1991 and 2002—8.2 versus 10.8 percent, with the highest increases of 26.3 percent occurring in Asians (Figure hp.6).

Since 1991, mortality rates for congestive heart failure have risen 6 percent; this is in contrast to rates for AMI and ASHD, which have fallen 14.7 and 19.2 percent (Figure hp.7). Mortality rates for other cardiovascular events, which include cerebrovascular accidents, intracranial bleeding, and ischemic brain damage, increased 25 percent. Rates of mortality due to cardiovascular disease are slightly higher in females, and 20–30 percent higher in whites compared to other races or ethnicities.

Improved pre-ESRD care and more aggressive treatment and prevention of cardiovascular disease in the general population should aid efforts to move toward the HP2010 target, and help reduce overall mortality in the ESRD population.

## Table hp.b & Figures hp.5–7

period prevalent ESRD patients; unadjusted. — For Hispanic patients we present data beginning in 1996, the first full year after the April 1995 introduction of the revised Medical Evidence form, which contains more specific questions on race & ethnicity.
Healthy People 2010

Data for Access

### Fistula Use in Prevalent Hemodialysis Patients (Percent of Patients; Year of Initiation of 2002 Cohort)

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*Values for cells with fewer than ten patients are suppressed.

### Arteriovenous Fistula Use in Prevalent Hemodialysis Patients (Percent of Patients; Year of Initiation of 2002 Cohort)

- **Fistula use**: Percentage of new patients using arteriovenous (AV) fistulas as their primary mode of vascular access.
- **Access insertions**: Percentage of prevalent hemodialysis patients who received an arteriovenous fistula, arteriovenous graft, or catheter.

### Arteriovenous Fistula Insertions in Prevalent Hemodialysis Patients (Year of Initiation of 2002 Cohort)

- **Insertions by Age and Race/Ethnicity**: Insertion rates are highest for those age 0–44; the small sample size in the 0–19 age group makes it difficult to draw conclusions.
- **Insertions by Gender and Diabetic Status**: Fistula insertion rates in men are 27 percent higher than in women; for both grafts and catheters, rates are 22 percent lower.

### Arteriovenous Fistula Use in Prevalent Hemodialysis Patients, by Age & Race/Ethnicity

### Access Insertions in Prevalent Hemodialysis Patients, by Gender & Diabetic Status

Some patients may have more than one access at a given point in time. For Hispanic patients we present data beginning in 1996, the first full year after the April 1995 introduction of the revised Medical Evidence form, which contains more specific questions on race & ethnicity.

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**HP2010 Objective 4.4**: Increase the proportion of new hemodialysis patients who use arteriovenous fistulas as their primary mode of vascular access.

The National Kidney Foundation's Kidney Disease Outcomes Quality Initiative (K/DOQI) recommends the use of arteriovenous (AV) fistulas to help improve clinical outcomes in hemodialysis patients. The percentage of new patients using a fistula in 2001 was 30.3, nearly 20 percent below the desired target (Figure hp.8).

AV fistula placement rates in new dialysis patients are highest for those age 0–44; the small sample size in the 0–19 age group makes it difficult to draw conclusions by age (Figure hp.9). By race/ethnicity, rates are highest in whites and Native Americans, and lowest in Asian patients.

Fistula insertion rates in men are 27 percent higher than in women; for both grafts and catheters, in contrast, rates are 22 percent lower (Figure hp.10). By diabetic status, rates for fistulas are almost equal while, for grafts and catheters they are 17–19 percent higher in diabetic patients compared to non-diabetics. Overall, fistula placement in U.S. dialysis patients continues to be much lower than desired.
**HP2010 Objective 14.29:**
Increase the proportion of adults vaccinated annually against influenza & ever vaccinated against pneumococcal disease

The overall influenza vaccination rate in the ESRD population increased nearly 16 percent in 2002; with only 54 percent of patients being vaccinated; it is still far, however, from the HP2010 goal of 90 percent (Table hp.d and Figure hp.11). Only 21 percent of pediatric patients, and 38 percent of those age 18–39, are vaccinated, and patients of minority races continue to be vaccinated at lower rates than white patients (Figure hp.12).

Between the 1997–1998 and 2001–2002 periods, rates of pneumococcal pneumonia vaccinations increased slightly in the ESRD population as a whole, and grew from 7.9 to 12.6 percent among Native American patients (Figure hp.13). They fell, however, for patients age 65 and above, and for Hispanic patients as well.

### Table hp.d & Figures hp.11–12
*Influenza: ESRD patients initiating therapy at least 90 days before September 1 of each year & alive on December 31; vaccinations tracked between September 1 & December 31 of each year. Pneumococcal pneumonia vaccinations in Table hp.d: point prevalent patients, 2001, with 90-day rule, alive on December 31, 2002; vaccinations tracked in 2001 & 2002.*

### Figure hp.13
*ESRD patients initiating therapy at least 90 days before the start of the period & alive on the period’s last day; vaccinations tracked during entire period. — [All figures] age calculated on the last day of the period. Medicare Parts A & B coverage during period. For Hispanic patients we present data beginning in 1996, the first full year after the April 1995 introduction of the revised Medical Evidence form, which contains more specific questions on race & ethnicity.*
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**HP2010 Objective 4.5: Increase the proportion of dialysis patients registered on the waiting list for transplant**

The percentage of patients on the waiting list or receiving a kidney within a year of beginning ESRD therapy has changed little since 1991. As of 2002, this percentage stood at 15.9—well below the target of 66 percent (Table hp.e and Figure hp.14).

Patients who are on the waiting list or receive a transplant within a year of starting treatment tend to be younger, and there is little difference between genders (Figure hp.15). By race/ethnicity, more Asian patients are wait-listed or have received a kidney within a year of initiation—in 2002, nearly 28 percent, compared to 18.4 and 19.2 percent of white and Hispanic patients, respectively. By primary cause of renal failure, those diagnosed with cystic kidney disease are the most likely to be wait-listed or transplanted within a year of starting treatment.

### Table hp.e & Figures hp.14–15

#### Percent of patients either wait-listed or receiving a deceased-donor kidney within one year of their ESRD initiation date

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### Figure hp.14

Percent of pts wait-listed or receiving a deceased-donor kidney within one year of ESRD initiation

### Figure hp.15

Patients wait-listed or receiving a deceased-donor kidney, by age, gender, race/ethnicity, & primary diagnosis

For Hispanic patients we present data beginning in 1996, the first full year after the April 1995 introduction of the revised Medical Evidence form, which contains more specific questions on race & ethnicity.
**HP2010 Objective 4.6:** Increase the proportion of patients with treated chronic kidney failure who receive a transplant within three years of registration on the waiting list.

The percent of incident dialysis patients who are transplanted within three years of registration on the transplant wait-list continues to fall—from nearly 25 percent in 1991 to 19.2 percent in 1999 (Table hp.f and Figure hp.16). The HP2010 target states that nearly one in three patients should receive a transplant within three years of registration.

The percent of patients transplanted varies widely, as expected, by age, with the youngest patients by far the most likely to receive a transplant (Figure hp.17). Males are somewhat more likely to be transplanted than females, and whites and Asians have the highest transplant rates when comparing racial and ethnic groups. By primary cause of ESRD, patients with cystic kidney disease or glomerulonephritis have the highest rates, and those with a primary diagnosis of diabetes or hypertension the lowest.

*Table hp.f & Figures hp.16–17* patients certified as having ESRD in the given year; patients older than 69 or with prior transplants are excluded. Percents are estimated using the Kaplan-Meier methodology. Followup is censored at removal from the list, death, or the end of the three-year period. (Figure hp.16) target level estimated as 30 percent by the USRDS. For Hispanic patients we present data beginning in 1996, the first full year after the April 1995 introduction of the revised Medical Evidence form, which contains more specific questions on race & ethnicity.
Healthy People 2010

HP2010 Objective 4.7: Reduce kidney failure due to diabetes since the late 1990s, rates of diabetic ESRD have begun to stabilize, remaining at 142–147 per million population since 1999 (Table hp.g and Figure hp.18). This may reflect changes in care among the general population, including better control of blood pressure and improved diabetic monitoring. Rates remain, however, nearly twice as high as the HP2010 target of 78, and show no signs of decreasing.

While overall rates of diabetic ESRD have increased 68 percent since 1992, rates have been stable for patients age 20–44 (Figure hp.19). For those age 75 and older, in contrast, rates have more than tripled. Like the overall incident rates, rates of ESRD due to diabetes show dramatic disparities by race (Figure hp.20). The 2002 rate for black patients, for instance, was 434 per million population—nearly four times higher than that among whites. Rates among blacks, however, have grown 63 percent since 1992, while the greatest increase has been in the white population, at 75 percent.

*Table hp.g* incident ESRD patients; rates by age adjusted for gender & race, rates by gender adjusted for age & race, & rates by race & ethnicity adjusted for age & gender. Rates for non-Hispanics are unadjusted. *Census data are not available for non-Hispanic blacks & whites, so rates cannot be calculated.*  

**Diabetes & pre-ESRD diabetic care.**  

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The 2000 U.S. Census allowed respondents to identify themselves by more than one race designation, which resulted in a higher number of self-designated Native Americans. This increased denominator explains the apparent fall in ESRD rates for Native Americans.
HP2010 Objective 4.8: Increase the proportion of persons with Type 1 or Type 2 diabetes & proteinuria who receive recommended medical therapy to reduce progression to chronic renal insufficiency.

Guidelines of the American Diabetes Association recommend 2–4 glycosylated hemoglobin tests per year, and annual lipid and eye exams. Testing rates continue to grow, but slowly, and in 2002 only 43 percent of general Medicare patients, and 37 percent of the pre-ESRD population, received all three preventive health tests (Table hp.h and Figure hp.21).

In both populations, the oldest patients are the least likely to receive all three tests (Figure hp.22). Differences in testing rates are particularly dramatic by race and ethnicity. In the general Medicare population, for example, only one-fifth of Native American patients received all three tests in 2002, compared to 42–44 percent of whites and Asians.

(Table hp.h & Figures hp.21–22) general Medicare: patients diagnosed with diabetes in each year, age 67 & older on December 31 of the diagnosis year, & continuously enrolled in Medicare during the diagnosis year & previous year. Patients enrolled in a managed care program or diagnosed with ESRD are excluded. Claims from diagnosis year & previous year searched for eye exam codes; claims from diagnosis year searched for lipid & HbA1c testing codes. Age calculated on December 31 of the diagnosis year. Pre-ESRD: incident patients age 67 & older at initiation, & with diabetes one year prior to start of ESRD. Patients enrolled in a managed care program or with Medicare as secondary payor are excluded. Eye exams tracked two years prior to start of ESRD; lipid & HbA1c testing tracked one year prior to start of ESRD. Age calculated at ESRD initiation. (Table hp.h & Figure hp.22) because of categorizations in the general Medicare database, racial & ethnic categories are mutually exclusive.
Chapter summary

Objective 4.1: Incident rates

Introduction

(Figure hp.1) Adjusted incident rates are currently 333 per million population, approximately 50 percent higher than the HP2010 target of 217. The rate of mortality from cardiovascular disease is 88 per 1,000 patients years at risk, 69 percent higher than the target rate of 52. Less than one-third of patients use a fistula, compared to a target of 50 percent. Only 54 percent of patients receive influenza vaccinations, far from the target of 90 percent. Sixteen percent of dialysis patients are wait-listed for a transplant or receive a deceased-donor kidney in the first year of therapy. Nineteen percent of incident dialysis patients receive a transplant within three years; the HP2010 target is 30 percent. And the incident rate of ESRD due to diabetes is 147 per million population, nearly twice the target of 78.

Objective 4.2: Cardiovascular disease

(Table hp.d & Figure hp.5) The rate of cardiovascular mortality appears to have peaked in the late 1990s, and has decreased slowly since then.

Objective 4.3: Arteriovenous fistulas

(Figure hp.8) Fistula use in prevalent patients has been stable at approximately 30 percent over the last ten years. (Figure hp.9) The rate of fistula placements has almost doubled over the last ten years, while that of graft insertions has declined. (Figure hp.10) Catheter insertion rates increased by almost 50 percent from 1991 through 1999, but have declined since then.

Objective 4.4: Transplant waiting list

(Figure hp.14) The percent of prevalent dialysis patients on the transplant wait-list or receiving a deceased-donor kidney in the first year of therapy has been fairly stable, at about 16. (Figure hp.15) Nearly half of the pediatric population is wait-listed for a transplant or receives a deceased donor transplant during the first year of dialysis; this number has, however, been declining.

Objective 4.5: Patients transplanted

(Figure hp.17) Dialysis patients age 19 and younger are the most likely to receive a transplant within three years of registration on the waiting list. Overall, 19 percent of patients receive a transplant in this time.

Objective 4.6: Diabetes

(Figure hp.18) Incident rates of ESRD due to diabetes appear to have leveled off since 1999. (Figure hp.19) Incident rates of diabetic ESRD in patients age 75 and older continue to climb, while they have stabilized for other age groups. (Figure hp.20) Among Native Americans, incident rates of diabetic ESRD have artificially decreased since 1998 as a direct result of improved and more accurate counting of the population in the 2000 U.S. Census.

Objective 4.7: Diabetic preventive care

(Figure hp.21) Recommended diabetic testing—glycosylated hemoglobin testing, annual lipid testing, and eye examinations—is given to approximately 43 percent of general Medicare patients with diabetes, but only 37 percent of diabetic pre-ESRD patients. (Figure hp.22) By age, patients age 80 and older are the least likely to receive diabetic preventive care. Testing rates are low in both black and Native American patients; since many Native American patients receive care through the Indian Health Service, however, not all tests are reported in the Medicare system.