

Trends of adjusted mortality in the first year of dialysis in the United States: 1985-2006

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United States Renal Data System

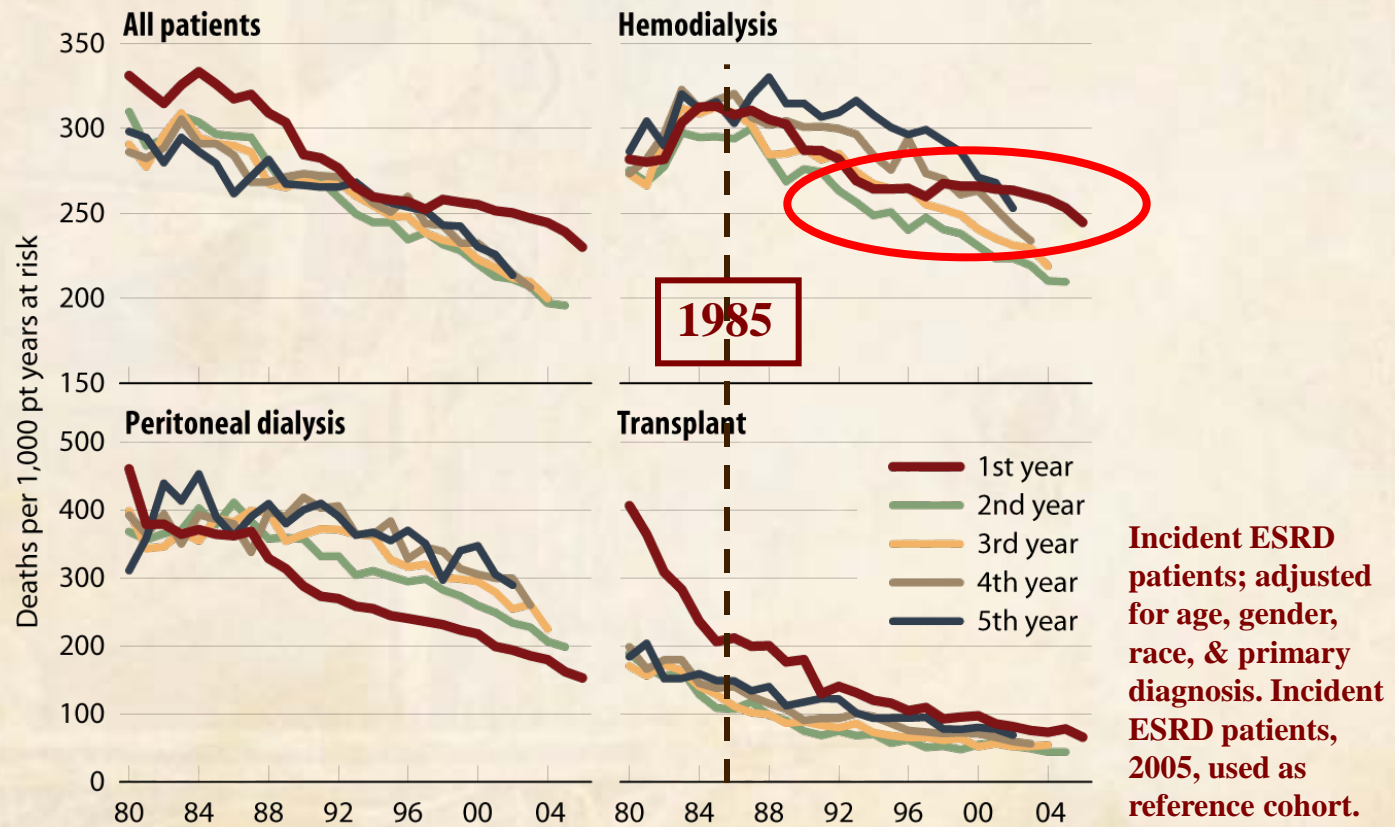
USRDS

Introduction

- **The 2009 USRDS ADR has documented major changes in the ESRD program over the past 20 years,**
 - **the incidence of ESRD has been increasing from 30,533 in 1985 to 111,008 in 2006; the incident rates of ESRD have more than doubled;**
 - **Prior to 1995, reported deaths in the first 90 days were mainly available for the Medicare population and after 1995 for all patients;**
 - **the demographic adjusted first-year mortality of dialysis patients after 90 days has declined: from 318.2 per 1,000 patient years in 1985 to 235.5 per 1,000 patient years in 2006.**
- **The impact of the demographic changes on the trends in early mortality for dialysis patients is unclear**

Adjusted mortality rates, by modality & year of treatment: Basic Adjustments only

Figure 6.1 (Volume 2)



Introduction (continued)

- **Our research questions include**
 - **What is the impact of the changing demographics on unadjusted and adjusted mortality patterns in the first months of ESRD treatment?**
- **Primary objective is**
 - **To examine the pattern of mortality in the first months of dialysis through calculating the death rates for the interval periods of month 1-2, 3-4, 5-6, 7-8, and 9-12 after the onset of ESRD for incident dialysis patients from 1985-2006.**

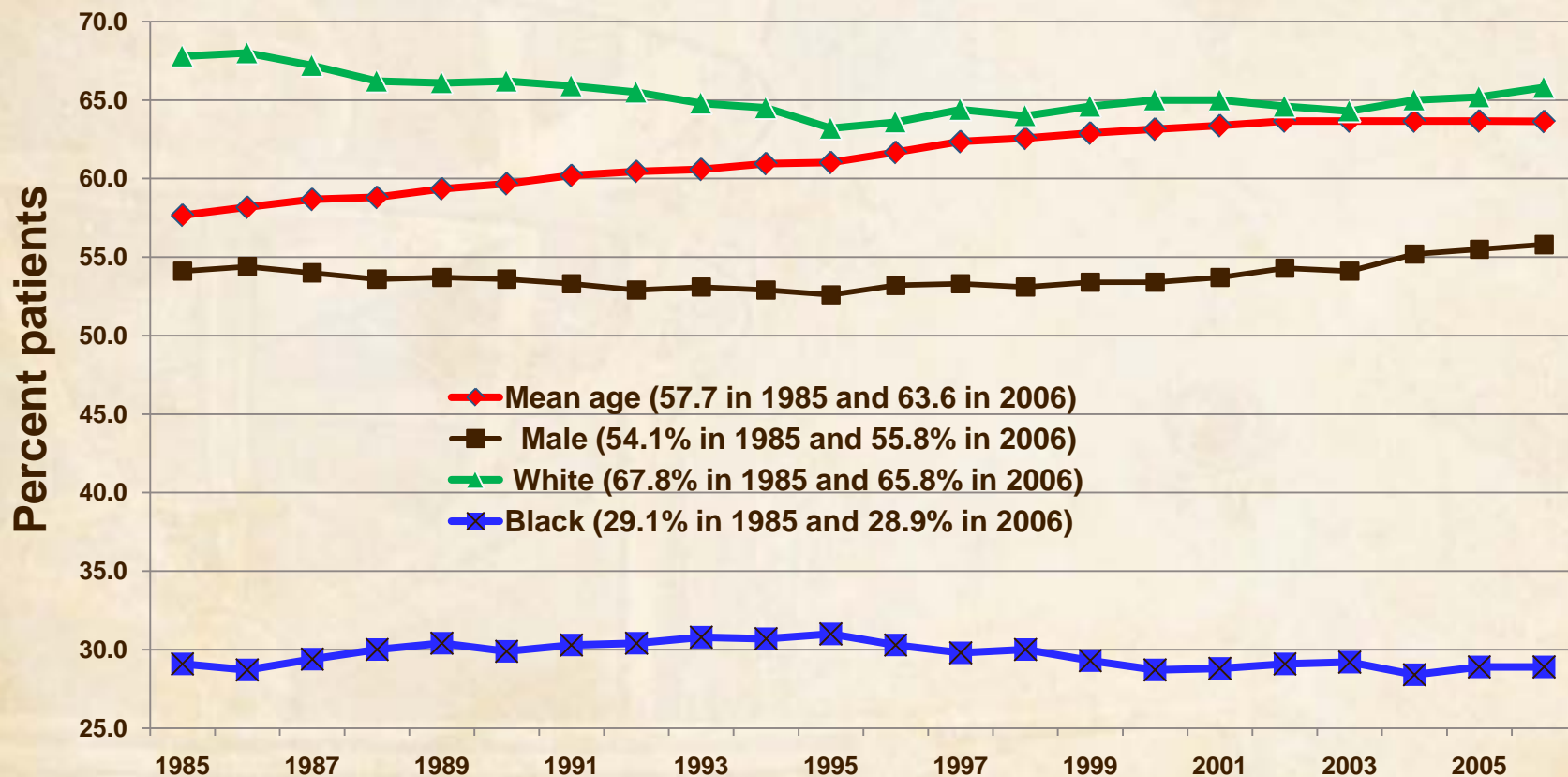
Methods

- **Study population**
 - **This study included 1985-2006 incident dialysis patients with age at least 20 years old.**
 - **The study event was death in the first year of dialysis.**
 - **Patients were followed from the first day of dialysis until one year and censored at loss to follow-up and transplantation.**
- **Sample size: 1,561,262 incident cases**

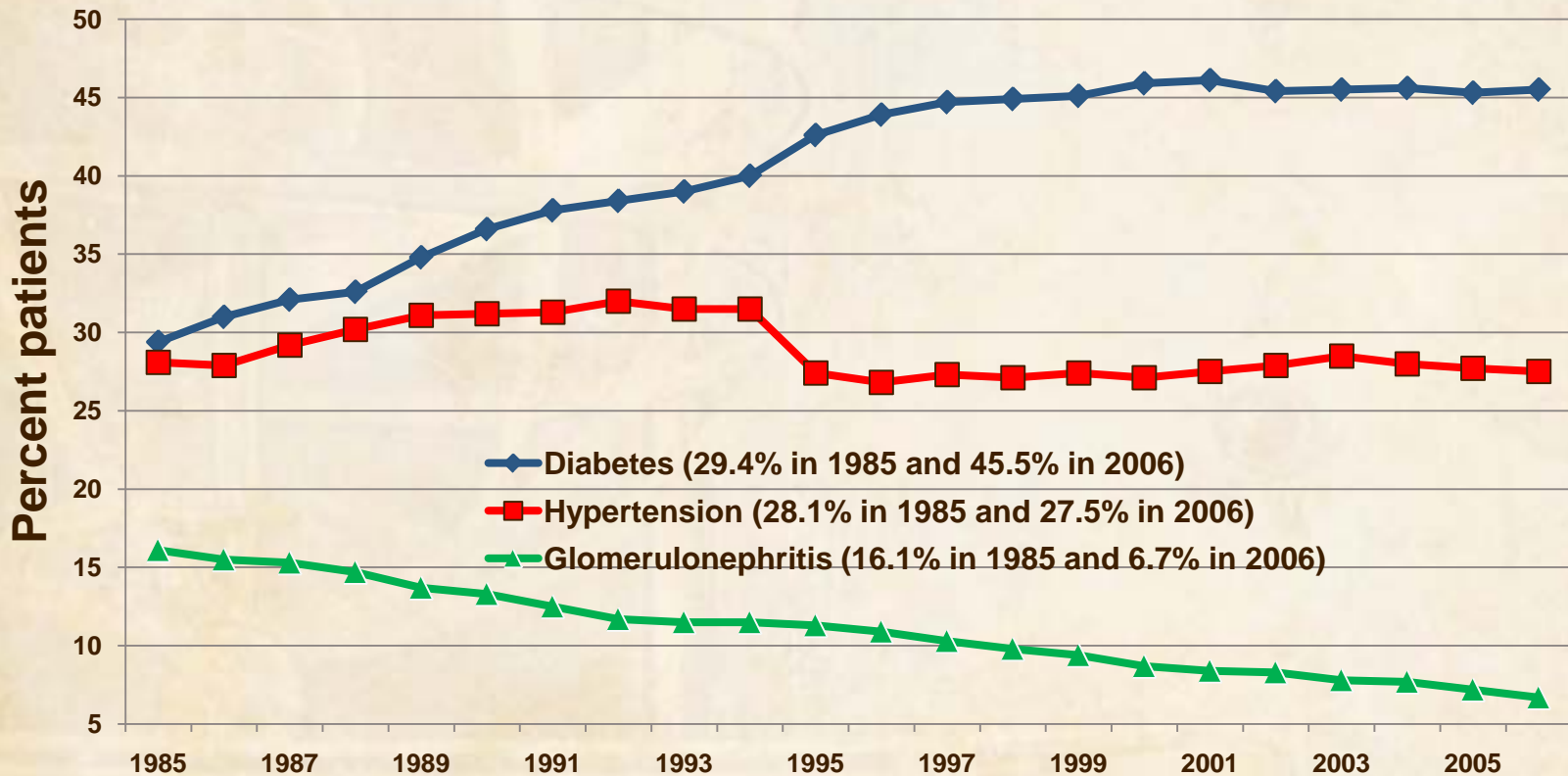
Methods (continued)

- **Mortality was calculated for the intervals of month 1-2, 3-4, 5-6, 7-8, 9-12 and one year; mortality was expressed as deaths per 1,000 patient years.**
- **Unadjusted mortality was calculated from Cox regression model.**
- **Adjusted mortality was calculated from Cox regression model with 2005 incident dialysis population as a reference.**
 - **Adjusted for demographic covariates: age, gender, race, and primary diagnosis;**
 - **Adjusted for additional covariates and baseline GFR, BMI, and hemoglobin.**

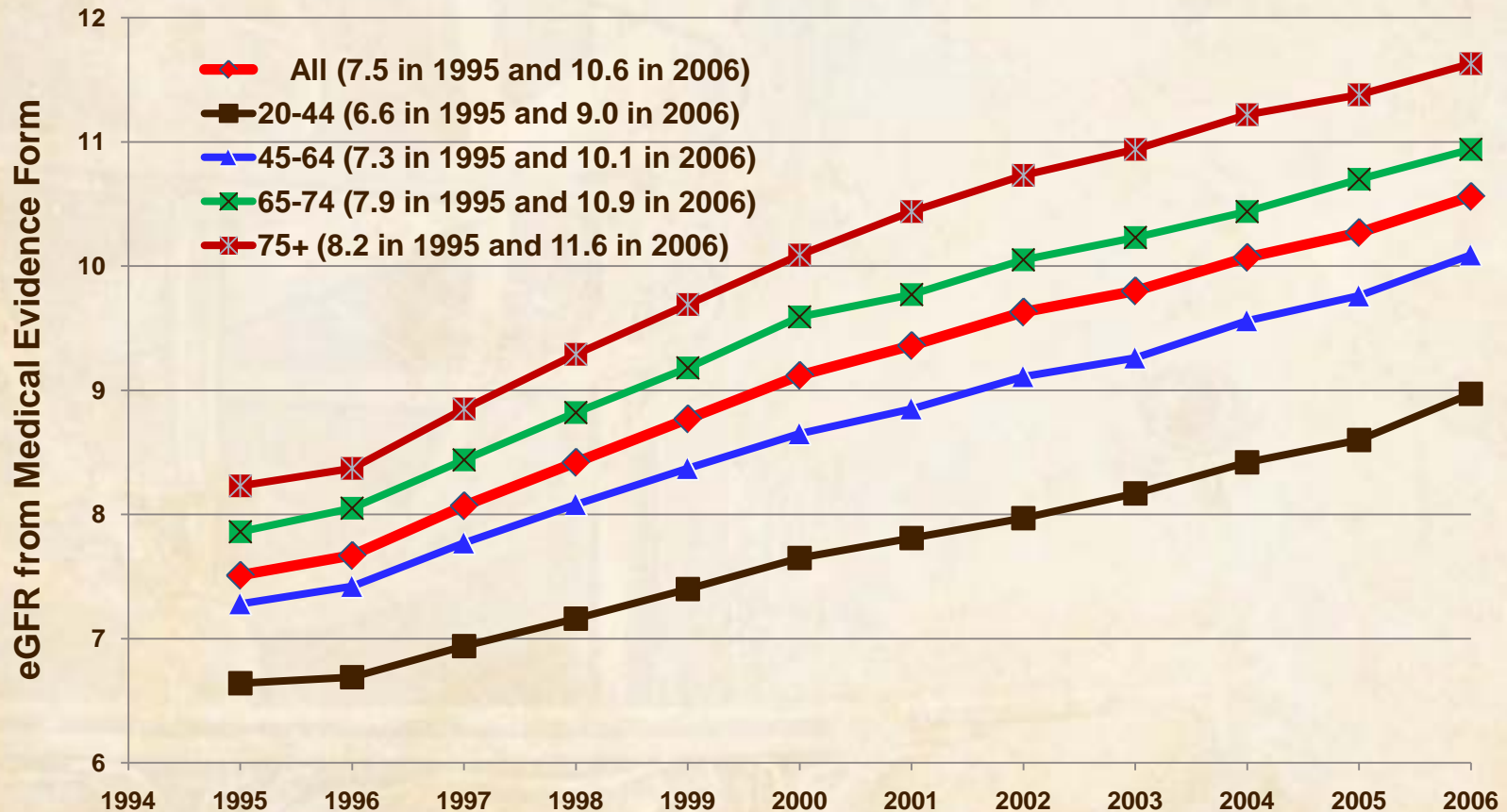
Trends of demographic characteristics in incident dialysis patients



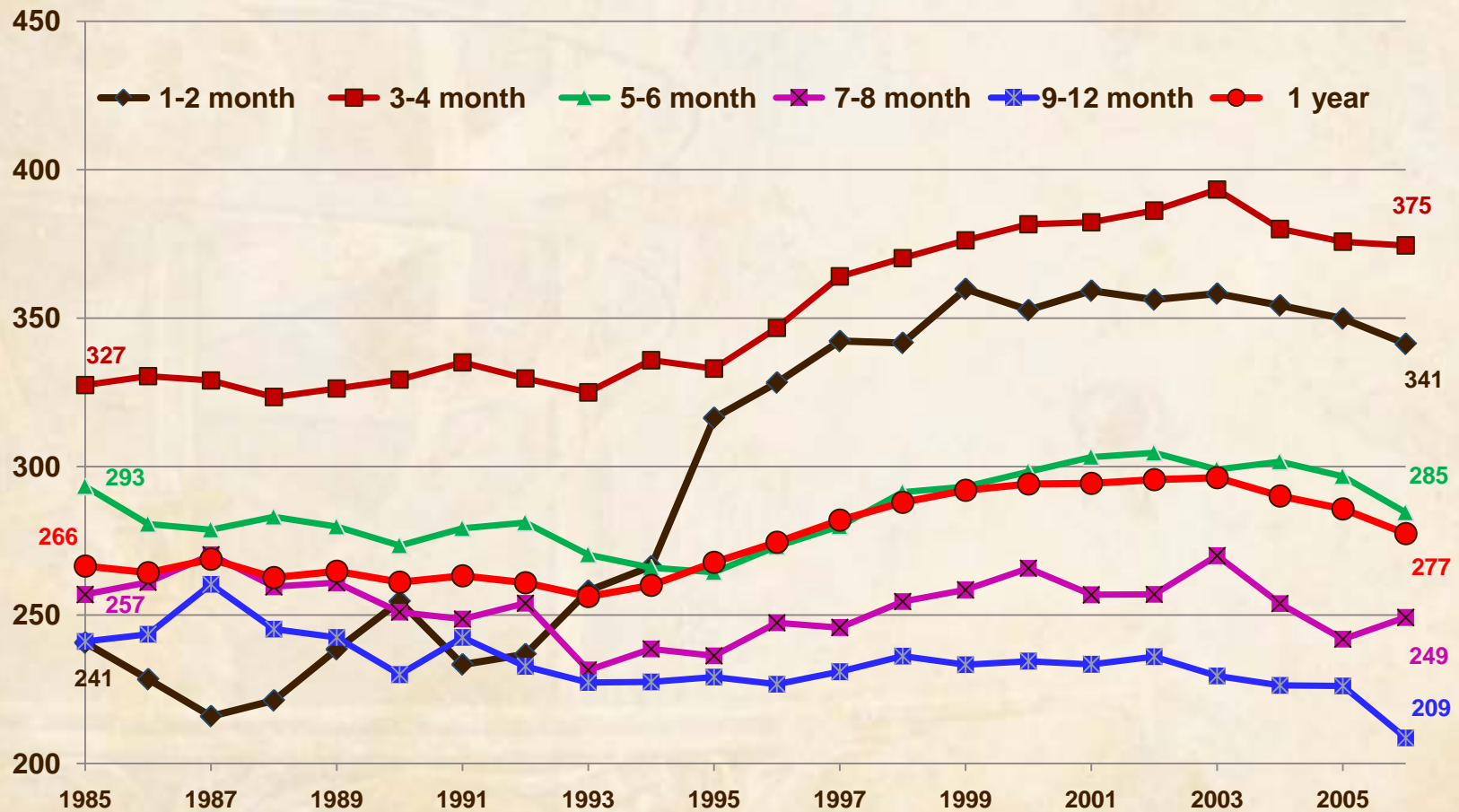
Trends of primary cause of ESRD in incident dialysis patients



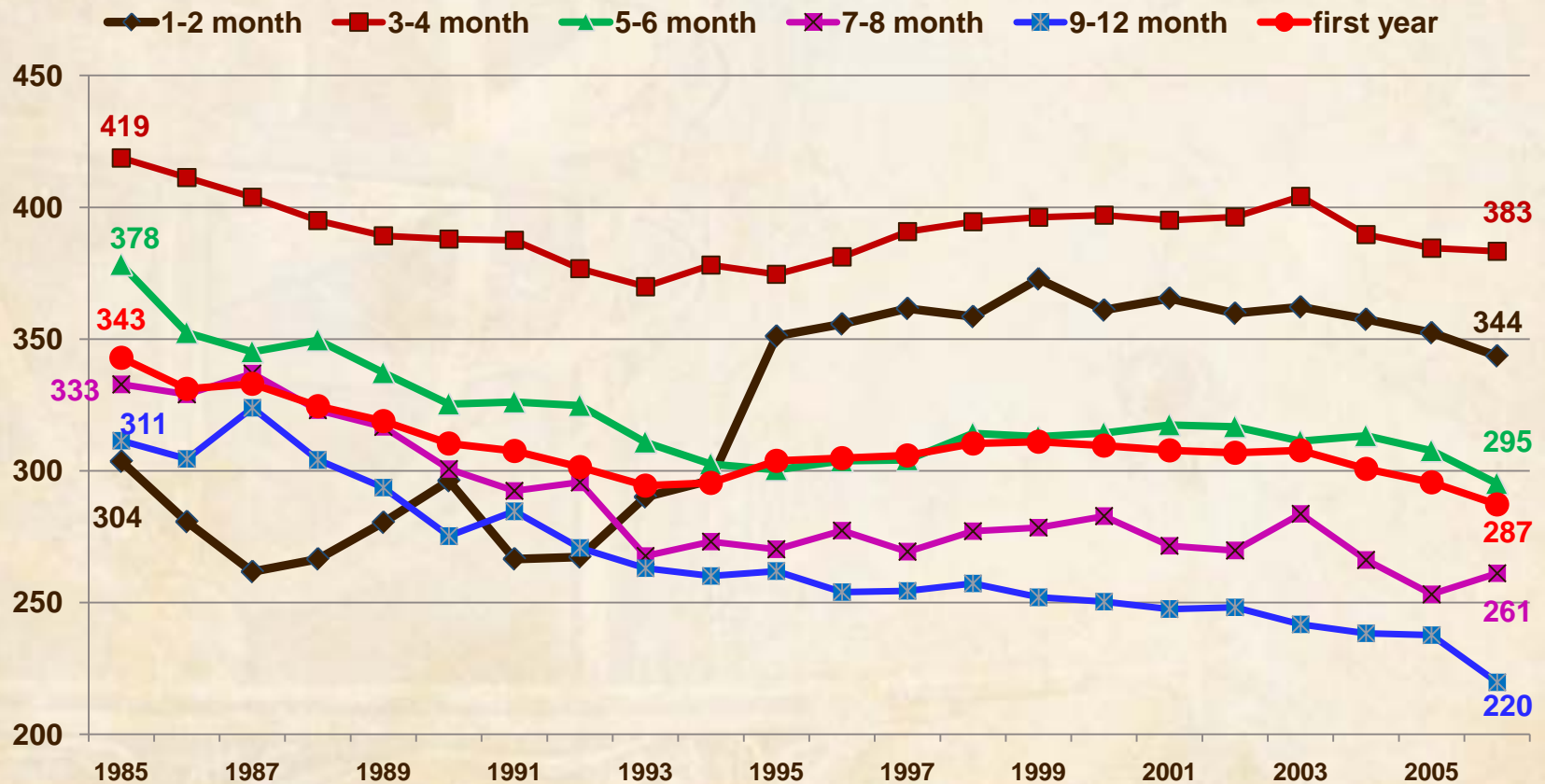
Trends of mean GFR at initiation of dialysis from ME Form 2728



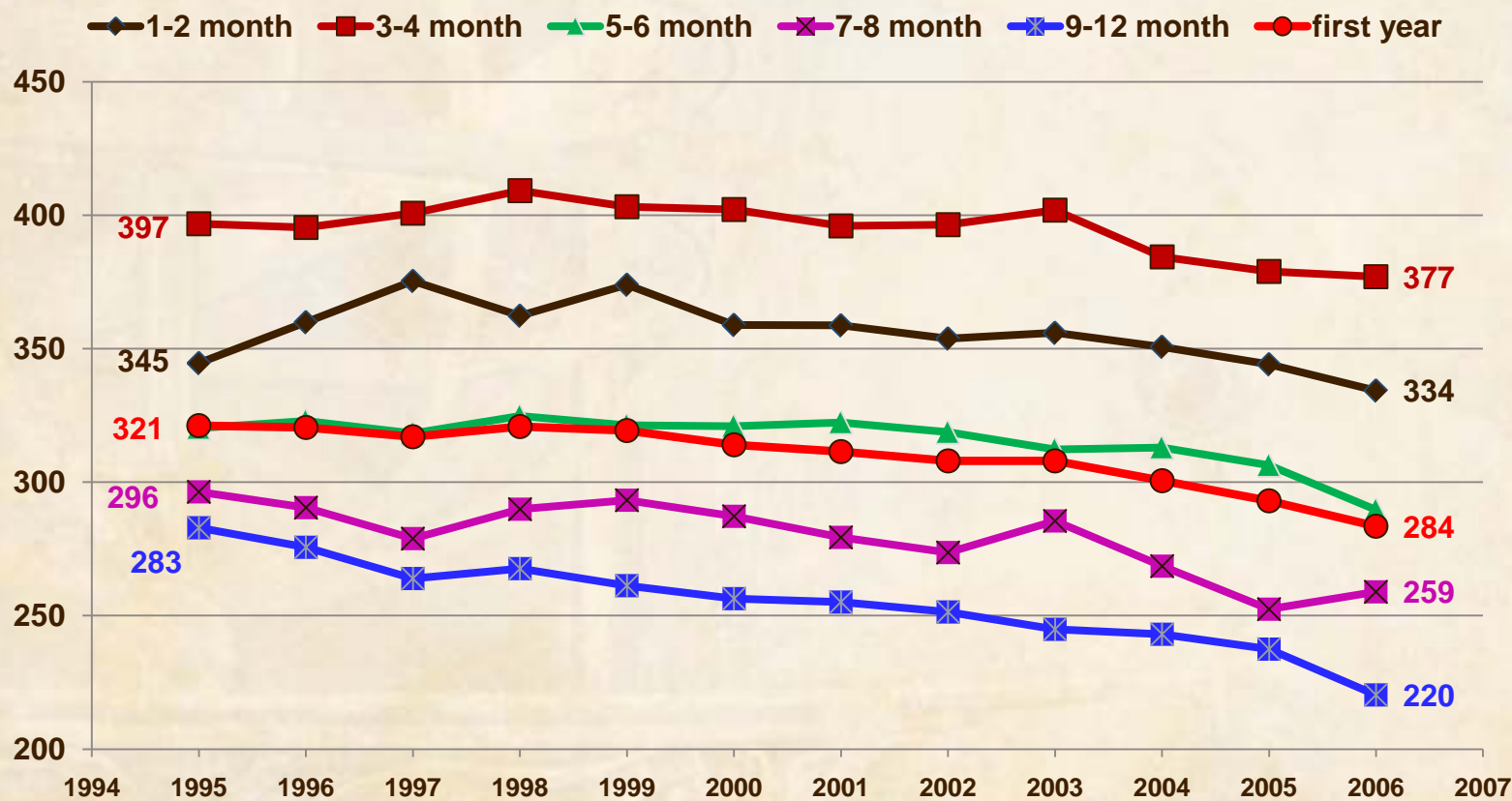
Unadjusted deaths per 1,000 Pt Yrs in the first months dialysis:



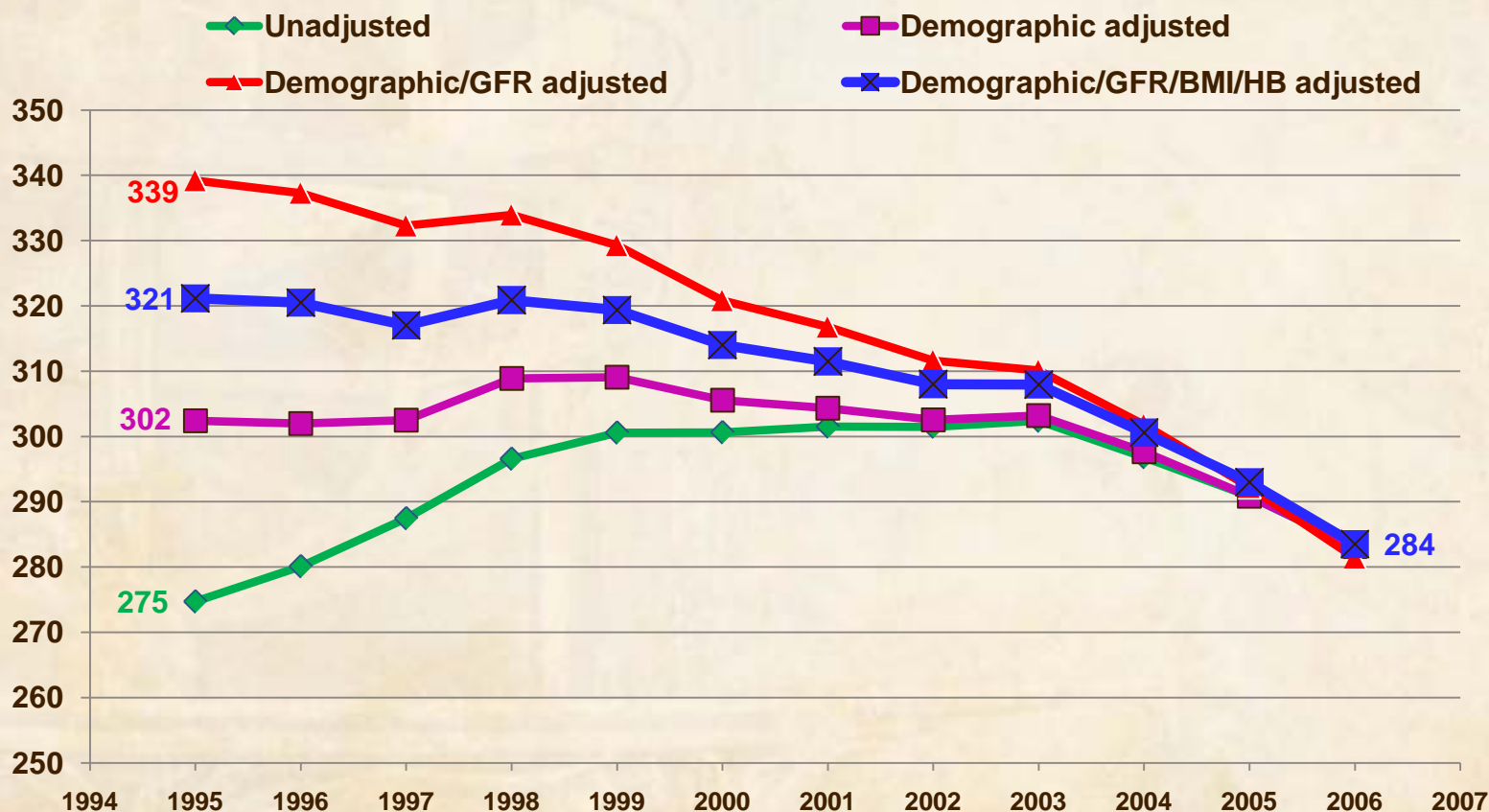
Demographic adjusted deaths per 1,000 Pt Yrs in the first year dialysis: Adjusted for Age, Gender Race and Dx



Demographic and eGFR/BMI/hemoglobin adjusted deaths per 1,000 Pt Yrs in the first year dialysis



Comparing unadjusted and adjusted mortality (deaths per 1,000 patient-years) in the first year dialysis



Summary

- In the past 20 years, demographics has changed:
 - age increased 6 years from 58 to 64 yrs old;
 - diabetes as ESRD cause increased from 29.4% to 45.5%;
 - mean eGFR at initiation increased from 7.5 to 10.6 overall.
- In the past 20 years, demographic adjusted mortality has following patterns:
 - 1-yr mortality declining from 1985 to 1993, slightly increasing to 1999, then declining with the lowest rate in 2006;
 - Mortality in early months was unstable and sharply increased around 1995 and then leveled out;
 - Mortality starting month 9 has been declining over many years
- In the past 10 years, demographic/GFR/BMI/Hb adjusted mortality has been declining.

Conclusions

- **Comparing death rates over the past 20 years may be challenging in that reporting of early death may have changed in the mid 1990 with universal ESRD registration and reporting of all deaths.**
- **This study shows early death rate have changed little from 1995 to 2003 but have declined recently.**
- **The recent changes in death rates may reflect changes in catheter utilization, improved CVD care and changes in infectious complications reported in the USRDS 2009 ADR.**
- **Further investigation is needed to assess the impact of changing vascular access utilization on death rates in the first year of dialysis as well as lead time bias.**