A Comparison of Projected ESRD Incidence and Prevalence with Recent Data

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Introduction

• The USRDS provides projections of the ESRD population for public policy considerations, and published projections to 2015 in 2007.
• Projections to 2020 were last updated in the 2009 Annual Data Report (ADR).
• A primary finding of those projections was that while incident rates of ESRD were slowing in many age and race groups, overall counts of the treated population continued to increase.
• Here we update actual incidence and prevalence numbers through 2007, to provide up to date potential growth of the ESRD program through 2020.

Methods

• A discrete-time, annually incremented, non-stationary Markov model was developed to model and project the ESRD population.
• The model, shown in simple form in Figure 1, contains 84 sub-states based on the cross-classification of:
  • Incident/prevalent
  • 7 age groups (0-18, 19-40, 41-64, 65-69, 70-74, 75-79, 80+)
  • 3 race groups (white, black, other)
  • 2 diabetes (as cause of renal failure) states (Y/N).
• USRDS data from 1978 through 2007 were used to obtain transition probabilities as well as past incident and prevalent counts.
• The model incorporates census projections (“Middle Series”) and expected changes in both age, race, and diabetes prevalence.
• Model parameters were extrapolated to 2020, in order to project ESRD incidence and prevalence counts through 2020.

Results

• Incident counts were virtually constant from 2006-2008, but increased 3.3% in 2009, somewhat larger than projected (Figures 2-3, table 1).
• Prevalent counts have been consistently increasing approximately 4% per year, and are also ahead of projected numbers (Figures 4-5, table 1).
• The model projects that the dialysis population will grow at a faster rate than the transplant population (Figure 6).
• By age, prevalent counts will increase at a faster rate in individuals age < 65 than in those less than 65, although the ESRD prevalent population less than 65 will still be significantly higher in absolute counts in 2020 (470,000 vs. 310,000, Figure 7).
• The treatment options to provide care for the increasing ESRD population will require policy makers and providers to address alternatives to the traditional in center 3 times per week hemodialysis treatment with its high costs and complication rates.

Conclusions

• Modeling assumptions were generally conservative, assuming flattening or even decreasing incident rates in some age/race groups.
• The post WWII population bulge is beginning to move into age groups with increasing chronic disease and increasing numbers of patients requiring renal replacement therapy, that drive the ESRD rates and projections.
• If incident rates increase in some groups and ESRD death rates continue to decline, the total number of patients requiring RRT will exceed these projections.

References


Figure 1: The ESRD Model

Figure 2: Actual and Projected Incidence Counts, by Age

Figure 3: Actual and Projected Prevalence Counts, by Age

Figure 4: Actual and Projected Incident Counts, by Modality

Figure 5: Actual and Predicted Prevalence Counts, by Modality

Table 1: Symbols: one-year % change

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<tr>
<th>Year</th>
<th>Actual</th>
<th>Projected</th>
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<td>2000</td>
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<td>2004</td>
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<td>628,639</td>
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<td>2005</td>
<td>670,858</td>
<td>661,787</td>
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</tbody>
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Figure 6: Projected and Actual Prevalence Counts, by Modality

Figure 7: Observed and Projected Prevalence Counts, by Age