TABLE E-1 Summary of Multivariate Poisson Regression Analysis Results, 1990-2003
NIS Data for Total Hip (THA) and Total Knee Arthroplasty (TKA) Procedures in the United States

Model		**P Values**[1]			
		Primary		Revision	
Parameter	**DOF**[2]	**THA**	**TKA**	**THA**	**TKA**
Year	1	0.0049	*[3]	0.0334	*
Age	7	*	*	*	*
Gender	1	*	*	0.8517	0.0413
Race	4	*	*	*	*
Region	3	*	*	*	*
Age×Gender	7	*	*	*	*
Age×Race	28	*	*	*	*
Gender×Race	4	*	*	0.2105	*
Age×Region	21	*	*	*	*
Gender×Region	3	*	0.0001	0.0004	0.0076
Race×Region	12	*	*	*	*
Year×Age	7	0.0038	*	*	*
Year×Gender	1	*	*	*	0.0158
Year×Race	4	*	*	*	*
Year×Region	3	*	*	*	*
Goodness of Fit[4]					
Deviance[4]: Primary Model		57,749.3	74,638.4	30,345.8	25,560.6
w/o Year		90,054.3	253,106.2	33,307.1	39,572.9
Δ Deviance		32,305.0	178,467.7	2,961.3	14,012.4
Δ^2 DOF		16	16	16	16
Pearson[5] χ^2: Primary Model		1.04	1.03	1.12	1.26

[1] P values of Type 3 likelihood ratio chi-square statistics for each covariate in regression model.

[2] degree of freedom (DOF)

[3] "*****" indicates a highly significant p value of <0.0001

[4] total deviance of the model

[5] to correct for over-dispersion, scaled Pearson chi-square values are presented

Electronic Appendix

Projection Methodology and Statistical Analyses

The projections and statistical analyses were all performed with use of the GENMOD procedures in SAS (V9.1.3; SAS Institute, Cary, NC). Deviance and Pearson chi square are traditional measures of the goodness of fit for Poisson regression models. Deviance is measured as the sum of the logarithms of the ratio between the observed value from the data and the model-predicted value with a theoretical minimal of 0 (i.e., $\log_e 1 = 0$, or a "perfect" fit). Pearson chi square is a different but largely equivalent measure of model fit, with values close to 1.0 as an indication of a good fit. Between two models, the one with a lower deviance indicates a better fit. One model fits significantly better than another when there is a substantial reduction in the value of the deviance (Δ *deviance*) when compared to a chi-square distribution with the appropriate degree of freedom. Deviance and Pearson chi-square values are reported for the various models of historical prevalence data between 1990 and 2003. The 95% prediction interval of a projected value was also calculated. The prediction interval was the confidence interval associated with an individual predicted value.