**Supplemental Digital Content 1:**

**Generalized linear mixed effect (logistic) model**

A generalised linear mixed effects (logistic) model was used to analyse the proportion of diagnosis-specific cardinal events in each study year (2004-2008), including presence/absence of cardinal event as the dependent variable, admission year as the independent variable, and random effects for the unique subject identifier.

A generalized linear mixed model (GLMM) for a dichotomous response variable yij has the form:

yij|**b ~** Bernouilli(πij)

where

logit(πij) = β0 + β1Yearj + bi and **b** ~ N(**0**,Σ),

and

yij is the response for the ith individual taken in Yearj ,

**b=**[b1, b2, …., bn] is the vector of random effects for the n individuals,

Σis the covariance matrix for random effects**b**,

β0 and β1 are fixed effects coefficients.

Prior to the analysis it was first necessary to restructure the data to include, for each individual (“rootnum”), a record for each year (“yearadm”) with an associated variable (“CE”) indicating whether they experienced a disease-specific cardinal event or not in that year. The size of this data file is the number of unique individuals who experience a cardinal event multiplied by the number of study years, in our case five years (2004 to 2008). The script to analyse the data in this structure, for the R statistical software, is given below:

library(lme4)

glmer( formula = CE ~ yearadm + (1|rootnum),

data=CEyeardata, family=binomial, nAGQ=1L)