

A NONPARAMETRIC ESTIMATOR OF THE SURVIVAL FUNCTION UNDER
PROGRESSIVE CENSORING

Joseph C. Gardiner

Michigan State University, East Lansing, Michigan

and

V. Susarla

State University of New York, Binghamton, New York

1. Introduction

The subject of nonparametric estimation of the survival function from incomplete or censored observations has received much attention for more than two decades. We may cite here the celebrated work of Kaplan and Meier (1958) where a product-limit (PL-) estimator of the survival curve is obtained from a sample in which each lifetime may be truncated (fixed censorship) due to limits on observation. In Breslow and Crowley (1974) the properties of this estimator are considered in the case of random censorship, where each lifetime has its own censoring random variable, and the lifetimes and censoring times being each independent and identically distributed (i.i.d.) sequences and also independent of each other. By utilizing the notion of Dirichlet process priors introduced by Ferguson (1973), Susarla and Van Ryzin (1976) obtain a nonparametric Bayesian estimator of the survival function which generalizes the PL-estimator of Kaplan and Meier.

The basic formulation in these works involves consideration of a random sample of lifetimes X_1, \dots, X_n which may not be completely observable due to the