THE GENERALIZED WARING PROCESS

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Abstract -- The Generalized Waring Distribution is a discrete distribution with a wide spectrum of applications in areas such as accident statistics, income analysis, environmental statistics, etc. It has been used as a model that better describes such practical situations as opposed to the Poisson Distribution or the Negative Binomial Distribution. Associated to both the Poisson and the Negative Binomial distributions are the well known Poisson and Pólya Processes. In this paper, the Generalized Waring Process is defined. Two models have been shown to lead to the Generalized Waring process. One is related to a Cox Process while the other is a Compound Poisson Process. The defined Generalized Waring Process is shown to be a stationary but non-homogenous Markov process. Several properties are studied and the intensity, the individual intensity, the Chapman-Kolmogorov differential equations of it, are obtained. Moreover, the Poisson and the Pólya processes are shown to arise as special cases of the Generalized Waring Process. Using this fact, some known results and some properties of them are obtained.

Keywords and Phrases -- Pólya process, accident proneness, accident liability, Markovian property, stationary increments, Cox process, transition probabilities, Chapman-Kolmogorov equations, individual intensity.