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FAILURE RATE OF THE INVERSE GAUSSIAN-WEIBULL MIXTURE MODEL

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Abstract. Motivated by the idea that different causes of failure of a given system could lead to different failure distributions, a mixture of two-component distributions, one of which is the two-parameter Inverse Gaussian (IG) and the other the two-parameter Weibull (W), is proposed as a failure model. The IG-W mixture model covers several types of failure rates (FR's). It is shown that depending on the parameter values, the IG-W mixture model is capable of covering six different combinations of FR's, as one of the components has an upsidedown bathtub failure rate (UBTFR) or increasing failure rate (IFR) and the other component has a decreasing failure rate (DFR), constant failure rate (CFR), or IFR. A study is made for the mixed FR based on these six combinations.

Key words and phrases: Inverse Gaussian distribution, Weibull distribution, mixture, failure rate.