A.V.V.M. Sri Pushpam College (Autonomous)
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## 3.7.1 Number of Collaborative activities per year for research/ faculty exchange/ student exchange/ internship/ on –the-job training/ project work

# Collaborating Agency:

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Date: 03.06.2016

# LINKAGE

## For the year 2016-2020

Between

1. Dr. A. VENKATESH
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&

2. Mr. R. MANIKANDAN
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Irungalur, Trichy (Dt)

Considering the significance of the noble cause for the student community, we have come forward to collaborate with each other to exchange research knowledge, expertise and library facilities to the process of scientific research and education in the field of Mathematics. The parties (mentioned above as 1. & 2.) have had preliminary discussion in this matter and have ascertained areas of broad consensus. The parties now therefore agreed to enter in writing these avenues of consensus, under a flexible linkage, and this project aims to fill the gap between knowledge demand and subject expertise related to the mentioned field.

***Joint Responsibilities***

- Sharing of library resources, database etc.,
- Joint Publication of research articles, books, magazines, bulletins etc.,
- Jointly organizing conferences, seminars, symposia and workshops.
- Submitting joint proposals for research funding from agencies like UGC, CSIR, DST and TNSCST

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# Fuzzy Mathematical Model Using NH Distribution for The Effect of Oxytocin

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***Abstract*—The study was to investigate the maternal heart rate effects for the women after the administration of oxytocin using Nadarajah and Haghighi distribution model. The fuzzy hazard rate function and fuzzy survival function are calculated for different alpha values. The result shows that if the survival rate increases then hazard rate decreases with respect to the time intervals.**

***Keywords*— Extended Exponential Distribution, Oxytocin, Survival Rate, Hazard Rate.**

***2010 Mathematics Subject Classification: 97Mxx, 93A30, 60-XX***

## I. INTRODUCTION

Among the parametric models, the exponential distribution is perhaps the extensively realistic statistical distribution in several fields. One of the reasons for its prominence is that the exponential distribution has constant hazard rate function. The exponentiated exponential (EE) distribution was introduced by Gupta et. al. [1]. Also Generalized exponential distribution development was discussed by Gupta and Kundu [3]. A new generalization of the exponential distribution as an alternative to the gamma, Weibull and EE distributions was recently proposed by Nadarajah and Haghighi [2] in 2011and if a random variable T follows Nadarajah and Haghighi [NH] distribution and it is denoted by T~NH(β, γ) where β – shape parameter, γ – scale parameter. It has some inspiration properties. The NH density function can be monotonically decreasing and yet its hazard rate function can be increasing.

The gamma, Weibull and EE distributions do not consent for an increasing hazard function when their respective densities are monotonically decreasing and it is related with the ability (or the inability) of the NH distribution to model data that have their mode fixed at zero. The gamma, Weibull and EE distributions are not suitable for situations of this kind.

Oxytocin is a protein produced by the pituitary gland of mammals including man. Pitocin is a man-made version of oxytocin used for stimulating contraction of the uterus. Oxytocin works by increasing the concentration of calcium inside muscle cells that control contraction of the uterus. Increased calcium increases contraction of the uterus. The FDA approved oxytocin in November 1980. Post-delivery haemorrhage (PPH) is possibly a serious obstacle of both vaginal and caesarean delivery. The prevalence of PPH is approximately 6% of all deliveries [5]. The most frequent cause of PPH is uterine atony; therefore, active management of the third stage of labour rather than expectant management is recommended [7], [8]. Currently vein vaccination of 5 iu of oxytocin is suggested as the prophylactic drug of choice to reduce the occurrence and sternness of PPH [8], [10]. The Haemodynamic effects of various types are discussed by [6], [9], [11].

The fundamental purpose of this work is to establish a mathematical model using Fuzzy Nadarajah and Haghighi Distribution for the effect of Oxytocin administration to determine the survival and hazard rate function for different time intervals.

## II. NOTATIONS

| | |
|---|---|
| $\beta$ | - Shape Parameter |
| $\gamma$ | - Scale Parameter |
| $t$ | - Time |
| $\bar{\beta}\ (\alpha)$ | - Alpha cut of Shape Parameter |
| $\bar{\lambda}\ (\alpha)$ | - Alpha cut of Scale Parameter |
| S(t) | - Survival Rate |
| h(t) | - hazard Rate |

## III. MATERIALS AND METHODS

*Fuzzy NH Distribution*

We assume that T is a continuous random variable with probability density function (p.d.f.) *f(t)* and cumulative distribution function (c.d.f.), giving the probability that the event has occurred by duration t.

The NH distribution is modest and it is raised from the exponentiated exponential (EE) distribution. The c.d.f. of NH distribution is given by

$$F(t) = 1 - e^{1-[1+\gamma t]^{\beta}}$$

If T~ NH (β, γ) then the p.d.f of T is given by

$$f(t) = \beta\gamma(1+\gamma t)^{\beta-1} e^{[1+\gamma t]^{\beta}}, \quad t>0.$$

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# Step-Stress and Truncated Acceptance Sampling Plan Model for the analysis of Vasopressin

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**Abstract**

The theoretical study was to investigate the release of Vasopressin. In this paper, we calculate the mean value for truncated acceptance sampling plan and Step-Stress mathematical models using Generalized Exponential distribution. The results showed that truncated acceptance sampling plan is better than Step-Stress model to find the mean value for the release of vasopressin.

**AMS Subject Classification:** 97Mxx, 93A30, 62F03
**Key Words and Phrases:** Truncated acceptance sampling plan, Step-Stress mathematical models, Vasopressin