

**UJI PARAMETER DISTRIBUSI LOGNORMAL  
MENGUNAKAN METODE SEKUENSIAL**

MPM = 108/10.

W/L

4

**SKRIPSI**



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Aulia Rahma Wiliastuti, 2008. **Uji Parameter Distribusi Lognormal Menggunakan Metode Sekuensial**. Skripsi ini dibawah bimbingan Drs. Eko Tjahjono dan Toha Saifudin S.Si, M.Si, Departemen Matematika Fakultas Sains dan Teknologi Universitas Airlangga.

## ABSTRAK

Uji sekuensial merupakan suatu metode statistika inferensi yang memiliki karakteristik utama yang membedakannya dengan uji hipotesis lainnya, yaitu banyaknya pengamatan yang diperlukan tidak ditetapkan sebelum percobaan. Pada uji sekuensial, pengambilan keputusan terdiri atas tiga keputusan yaitu: memilih gagal menolak hipotesis (terima hipotesis), tolak hipotesis, atau lanjutkan percobaan dengan melakukan percobaan tambahan.

Dalam uji sekuensial untuk Distribusi Lognormal dalam mengambil keputusan, mempunyai daerah lanjutkan percobaan  $a_m < \sum_{i=1}^m \ln x_i < r_m$  dengan  $a_m$  adalah daerah penerimaan dan  $r_m$  adalah daerah penolakan di mana,

$$a_m = \left( \frac{\sigma^2}{\mu_1 - \mu_0} \log \frac{\beta}{1-\alpha} \right) + \left( \frac{m(\mu_1^2 - \mu_0^2)}{2(\mu_1 - \mu_0)} \right), \quad r_m = \left( \frac{\sigma^2}{\mu_1 - \mu_0} \log \frac{1-\beta}{\alpha} \right) + \left( \frac{m(\mu_1^2 - \mu_0^2)}{2(\mu_1 - \mu_0)} \right)$$

dan diperoleh bentuk fungsi karakteristik operasi dan fungsi rata-rata ukuran sampel sebagai berikut :

$$L(\mu) \approx \frac{\left( \frac{1-\beta}{\alpha} \right)^{\frac{\mu_1^2 - \mu_0^2 - 2\mu(\mu_1 - \mu_0)}{(\mu_1 - \mu_0)^2}} - 1}{\left( \frac{1-\beta}{\alpha} \right)^{\frac{\mu_1^2 - \mu_0^2 - 2\mu(\mu_1 - \mu_0)}{(\mu_1 - \mu_0)^2}} - \left( \frac{\beta}{1-\alpha} \right)^{\frac{\mu_1^2 - \mu_0^2 - 2\mu(\mu_1 - \mu_0)}{(\mu_1 - \mu_0)^2}}}$$

$$E_{\mu}(n) \approx 2\sigma^2 \frac{L(\mu) \log B + (1 - L(\mu)) \log A}{\mu_0^2 - \mu_1^2 + 2(\mu_1 - \mu_0)\mu}$$

Dari contoh kasus tentang 49 data balita RSUD Haji tahun 2006 dengan pengukuran berat badan, diperoleh  $\mu = 2.2589$  yang merupakan parameter sebenarnya dari plot uji distribusi lognormal. Berdasarkan simulasi pada data dengan 100 *running* uji sekuensial diperoleh 99 kali keputusan terima  $H_0$ , sehingga

$$FKO = \frac{99}{100} = 0.99 \text{ dan diperoleh FRUS sebesar } 10.39.$$

**Kata Kunci :** *Distribusi Lognormal, Statistik Uji Sekuensial, Fungsi Karakteristik Operasi, Fungsi Rataan Ukuran Sampel.*

Aulia Rahma Wiliastuti, 2008. **Parameter Test in Lognormal Distribution Using Sequential Method**. This script is under the guidance of Drs. Eko Tjahjono and Toha Saifudin S.Si, M.Si, Department of Mathematics, Faculty of Science and Technology Airlangga University.

## ABSTRACT

Sequential test is a statistical inference's method which has a main characteristic that difference with another hypothesis test, it is the quantity of observations of experiments didn't fixed before the experiments started. At sequential method, the derivation of decision to consist of : choose failure to reject a hypothesis (accepted hypothesis), rejected a hypothesis or, continued the experiment with extra experiments.

In sequential test for Lognormal Distribution in order to take the decision, it has continued the experiment  $a_m < \sum_{i=1}^m \ln x_i < r_m$  with  $a_m$  is accepted region and

$r_m$  is rejected region, where :

$$a_m = \left( \frac{\sigma^2}{\mu_1 - \mu_0} \log \frac{\beta}{1-\alpha} \right) + \left( \frac{m(\mu_1^2 - \mu_0^2)}{2(\mu_1 - \mu_0)} \right), \quad r_m = \left( \frac{\sigma^2}{\mu_1 - \mu_0} \log \frac{1-\beta}{\alpha} \right) + \left( \frac{m(\mu_1^2 - \mu_0^2)}{2(\mu_1 - \mu_0)} \right)$$

and obtained the operational characteristic function form and also the sample size's mean function form, that is :

$$L(\mu) \approx \frac{\left( \frac{1-\beta}{\alpha} \right)^{\frac{\mu_1^2 - \mu_0^2 - 2\mu(\mu_1 - \mu_0)}{(\mu_1 - \mu_0)^2}} - 1}{\left( \frac{1-\beta}{\alpha} \right)^{\frac{\mu_1^2 - \mu_0^2 - 2\mu(\mu_1 - \mu_0)}{(\mu_1 - \mu_0)^2}} - \left( \frac{\beta}{1-\alpha} \right)^{\frac{\mu_1^2 - \mu_0^2 - 2\mu(\mu_1 - \mu_0)}{(\mu_1 - \mu_0)^2}}}$$

$$E_\mu(n) \approx 2\sigma^2 \frac{L(\mu) \log B + (1 - L(\mu)) \log A}{\mu_0^2 - \mu_1^2 + 2(\mu_1 - \mu_0)\mu}$$

From example of data about Balita in RSU Haji with measurement heavy of body, founded conclusions that  $\mu = 2.2589$  is the thruth parameter from plot of sequential test in lognormal distribution. Based on data's simulation with 100 running of sequential test , obtained 99 times of acceptance  $H_0$  results, make

$$FKO = \frac{99}{100} = 0.99, \text{ and } FRUS = \frac{\sum_{i=1}^{100} \ln x_i}{100} = \frac{1039}{100} = 10.39.$$

**Keywords** : *Lognormal Distribution, Sequential Method, Operation Characteristic, Function Average Sample Number Function.*