Construction of Morbidity Table for Comparative Analysis of Renewed Every-year and Not Renewed Every-year Premiums on Eight Catastrophic Diseases in Indonesia

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Abstract Insurance company needs to set up reserve of funds that will be given to the insured if the insured suffer risk that stated in the policy. Therefore, accurate premium calculations is necessary to reduce the payment default risk of the insurance company. In this research, the renewed every-year and not renewed every-year net premiums will be comparatively analyzed using an actuarial approach.

In premium calculations, a morbidity table needs to be constructed to determine the probability of a person getting a disease. Survival function will be made first to construct the morbidity table using data from a social health insurance company in Indonesia for eight catastrophic diseases for each sex. By performing fitting distribution, the survival function of individual getting catastrophic diseases follow Log-Gamma distribution for both genders. Using the same data, the average hospitalization cost for each disease is also calculated.

The objective of this research is to compare the renewed every-year and not renewed every-year net premiums for the eight catastrophic diseases in Indonesia by giving the advantages and disadvantages for both insurer and insured.

Keywords Morbidity Table, Premium, Health Insurance

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1 Introduction

One of the fundamental rights of humans is the right to get proper healthcare services that are important for humans to survive and do daily activities. Human health is mostly affected by lifestyle, genetic factors, environment, and healthcare services. Even though these factors can be managed well to achieve optimal health conditions, the risk of getting a disease is still uncertain because every individual has the potential to experience such risks. The high cost of medical treatment nowadays is also a barrier for those who want to recover from their illness. Even individuals with high average wealth are still at risk of losing everything just to maintain good health and recover from illness because of the uncertain amount of expenses to be covered. However, all the risks mentioned above can be managed well with proper preparation. One of the efforts that can be made is health insurance.

Health insurance provides guarantees or health benefits to policyholders, such as financial coverage that can be used for medical and care treatment when they are afflicted with a disease. To get these benefits, policyholders need to pay contributions known as premiums. One of the factors that determine the size of health insurance premiums is the probability of policyholders contracting a disease. The higher the probability of policyholders contracting a disease, the higher the premiums will be.

In this research, the researcher will analyze and compare the premiums between renewed every-year and not renewed every-year premiums for eight types of catastrophic diseases in Indonesia. Catastrophic diseases are illnesses that require long time and expensive medical care. Based on the National Health Insurance Program (JKN) provided by BPJS Indonesia, some examples of catastrophic diseases are heart disease, kidney failure, cancer, stroke, cirrhosis, thalassemia, leukemia, and hemophilia.

The calculation of premiums in this research will refer to the premium calculations from a study titled **"Study on Calculation Model of Health Insurance Premium for Poor Family"** authored by Sukono, Sudrajat, et al. (2015). which uses the Indonesian Mortality Table *(RP-2000 Combined Healthy Male and Female)* in calculating premiums. In this research, a new morbidity table will be constructed based on data obtained from a social health insurance company to calculate the probability of someone contracting a disease instead of using mortality table. The objective of this research is to compare the renewed every-year and not renewed every-year net premiums for the eight catastrophic diseases in Indonesia by giving the advantages and disadvantages for both insurer and the insured.

2 Literature Review

The health insurance industry has been increasing due to high industry competition. However, all companies still do not have specific standards for various catastrophic diseases in Indonesia resulting difference in determining premium rates. Therefore, a morbidity table is constructed for these catastrophic diseases. Basically, the concept of morbidity has the same concept as mortality. In determining life insurance premiums, a mortality table is used to determine someone's life or death probability. Similar in health insurance, a morbidity table is used to determine the probability of someone contracting disease. Morbidity tables can be constructed by finding the distribution of selected data based on the smallest Residual Sum of Squares value. In the field of statistics, the Residual Sum of Squares is a technique used to analyze and determine the measure of dispersion in a dataset. RSS (Residual Sum of Squares) can also be interpreted as the sum of the squared distances of errors. A model is considered good when it has a small RSS value. The RSS value is obtained by calculating the difference between the actual or observed data values and the predicted values obtained from the formed model. RSS can be formulated as follows:

$$\text{RSS} = \sum_{i=1}^{n} (y_i - \hat{y})^2 \tag{1}$$

The smallest Residual Sum of Squares value will be selected to determine the distribution that will be used. After determining the distribution, the next step is to form the survival function based on the chosen distribution. The survival function is a quantity that depicts the time phenomenon of an event (Klein Moeschberger, 2003). The survival function is often denoted as S(t) or the probability that a subject experiences an event beyond time (t), which can be formulated as follows:

$$S(t) = P(T \geq t) = \int_{t}^{\infty} f(x)dx \tag{2}$$

where $f(x)$ is the probability density function. In the next step, researchers will calculate health insurance premiums using the morbidity table. Health insurance premium is an amount paid by the insured to the insurance company based on the insurance coverage agreement stated in the insurance policy. The calculation of health insurance premiums concept is similar to life insurance premium calculation. The main difference is the consideration of hospital treatment costs in the calculation.

The net single premium for health insurance can be calculated using the following formula:

$$A = T^{sh} \sum_{t=0}^{n-1} v^{t+\frac{1}{2}} {}_t p_x q^{sh}_{x+t} \tag{3}$$

with A as net single premium, T^{sh} as the average number of hospitalization days, v^t s the discount factor for t years, ${}_t p_x$ as the probability of life, dan q^{sh}_{x+t} as the probability of someone experiencing the disease.

To calculate the premiums paid periodically, the following formula can be used:

$$\text{Premium Value = Benefit Value}$$

$$P\ddot{a} = A. \tag{4}$$

By substituting equation (1) into equation (2), we obtain:

$$P \cdot \ddot{a}_{x:n|} = T^{sh} \textstyle\sum_{t=0}^{n-1} v^{t+\frac{1}{2}} {}_t p_x q^{sh}_{x+t}$$

$$P = \frac{T^{sh} \sum_{t=0}^{n-1} v^{t+\frac{1}{2}} \frac{l_{x+t}}{l_x} q^{sh}_{x+t}}{\frac{N_x - N_{x+n}}{D_x}}$$

$$P = \frac{T^{sh} \sum_{t=0}^{n-1} \bar{D}_{x+t} q^{sh}_{x+t}}{N_x - N_{x+n}} \tag{5}$$

with l_x as the number of individuals alive at age x, $D_x = v^x l_x$, $\bar{D}_x = v^{t+\frac{1}{2}} l_x$, and $N_x = \sum_{i=0}^{n} D_{x+i}$.

3 Data and Research Method

3.1 Description of Data

In this study, the used data consists of a sample of healthcare services provided by *Fasilitas Kesehatan Rujukan Tingkat Lanjutan* (FKRTL) of BPJS Kesehatan (Indonesia's National Health Insurance) from the years 2015-2016. The FKRTL service data includes information such as the characteristics of the healthcare facilities, types of services, Indonesian Case Base Group (INA-CBGs) diagnosis codes, Case Mix Group (CMG) codes, and claims. Since the data is still raw data, data cleaning is needed. The variables needed for analysis include participant IDs, disease types, age, and the amount of tariff for each claim. The analysis will focus on catastrophic diseases in Indonesia.

According to the book **"Statistik JKN 2015-2019" (JKN Statistics 2015-2019)**, the selected catastrophic diseases are **chirrhosis hepatitis**, **kidney failure**, **hemophilia**, **heart disease**, **cancer**, **leukemia**, **stroke**, and **thalassemia**.

Data Processing:

1. Duplicated Data
In the construction of morbidity tables, the researcher requires data on the number of patients suffering from a specific disease. In this stage, participant IDs that appear more than one will be counted as one data point.

2. Missing Value
Missing data can impact algorithms. Often, algorithms cannot run or cannot handle missing values in the data. In this stage, the researcher will remove data with missing values.

3. Merging Data
The analysis process will require both Patient ID data and visit number data. These two datasets will be merged and connected using the unique participant ID variable (PSTV01).

4. Variable of Age
The calculation of premiums requires information on the age at the time of the first visit. In this stage, a new variable will be created named patient age by subtracting the patient's date of birth from the date of the patient's visit.

5. Checking Data
In this stage, patients with the same ID and age will be removed from the data.

6. Classification of Disease
The analysis will be conducted on eight catastrophic diseases in Indonesia. In this stage, the data will be grouped based on the International Statistical Classification of Diseases and Related Health Problems-10 (ICD-10).

7. Final Data
   The data cleaning process concludes with the merging of the eight catastrophic diseases dataset with the patient ID variable and patient age variable. Then, the data is final and complete to use.

3.2 Research Methodology

This research is based on the literature review method, which begins with searching for reference literature that will be guidelines for analysis. The used literature is titled **"Study on Calculation Model of Health Insurance Premium for Poor Family"** authored by Sukono, Sudrajat, et al. (2015). This literature provides insights about the process of premiums calculation for each individual. The literature also classifies premium calculations into renewed every-year and not renewed every-year categories. The author of the reference literature utilizes mortality tables to calculate the probability of an individual experiencing an event. However, in this particular study, aligned with the health insurance sector, the calculation of the probability of an individual experiencing an event will be based on a constructed morbidity table based on the acquired data. In this section, the researcher will elucidate information about the steps involved. The research scheme will follow the following steps:

1. Fitting distributions using the available ***distfit*** function in Python programming. The *distfit* function will perform fitting on 89 univariate distributions. The criteria used in fitting the distribution is RSS (Residual Sum of Squares). The best distribution will be chosen by the lowest RSS value.

2. Creating morbidity table for each gender based on the obtained survival function.

3. Calculating the average hospitalized cost for each catastrophic disease.

4. Calculating net premiums for health insurance that are renewed every-year and not renewed every-year then divide them into two groups based on sex.

3.3 Premium *Renewed Every-year* dan *Not Renewed Every-year*

Individuals that buy insurance product will pay premiums to keep the insurance policy valid. The premium that will be paid can be renewed or not renewed every payment period depending on the insurer's age .

Premium Calculation *Renewed Every-year*. Renewed every-year premium is a premium that can be changed every year depending on the insurer's age Premium *Renewed Every-year* calculation follows the formula :

$$P = \frac{T^{sh}\bar{D}_{x+t}q^{sh}_{x+t}}{N_{x+t} - N_{x+t+1}}, t = 0, 1, 2, ..., (n-1) \qquad (6)$$

Premium Calculation *Not Renewed Every-year*. Not renewed every-year premium is a premium that has constant payment every year and not depends on the insurer's age. Premium *Not Renewed Every-year* calculation follows the formula :

$$P = \frac{T^{sh}\sum_{t=0}^{n-1}\bar{D}_{x+t}q^{sh}_{x+t}}{N_x - N_{x+n}} \qquad (7)$$

4 Result and Discussion

Subsequent to conducting data processing and obtaining the final data, this section will be divided into three main topics: Constructing Morbidity Table, Calculation of Average Hospitalized Cost, and Calculation of Premiums.

4.1 Constructing Morbidity Table

Before proceeding with the fitting distribution, the distribution of age data for individuals affected by catastrophic diseases will be examined through visualization using boxplots for each gender.

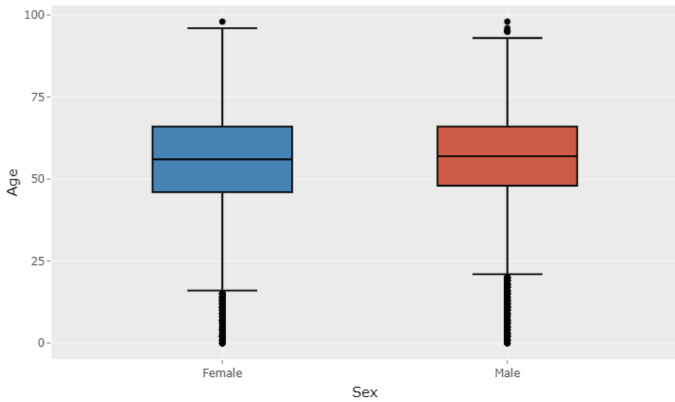

Figure 1. Boxplot of Age of Individuals Affected by Catastrophic Diseases for Each Sex

From the **Figure 1**, it can be observed that the median values for males and females are 56 and 57, respectively. Additionally, a significant number of individuals affected by catastrophic diseases are observed at a young age, as indicated by the presence of outliers below the lower fence. This phenomenon could possibly be caused by a couple of factors, internal factors like inherited genetic disorders and external factors like alcohol, drug use, environmental health, nutrition, etc. This is very common to happen in recent years, so we as young people need to be cautious and aware of these eight catastrophic diseases. Genetic disorders also play a big role in increasing the number of early-aged patients of eight catastrophic diseases, because most of the diseases if not all is a genetically inherited diseases. Early-aged people with genetic disorders are more likely to suffer from the condition compared to one with normal genetics, so with the support of external factors, the age of the patient when first diagnosed should be younger. As an actuary, we also need to be careful in calculating the probability of experiencing a disease among young individuals. Currently, it can be said that the probability of the occurrence of a catastrophic disease among the young population is higher. But, in the future, there is a possibility that this characteristic will change, and the occurrence of a catastrophic disease among youth could be lower or maybe any other possible characteristics. Therefore, when constructing morbidity tables, it is important to analyze the characteristics of the population itself. If the probability of youth is higher than the elder then the distribution will be positively skewed, and vice versa. With an understanding of the characteristics, it can be checked whether the result of the calculation is right or wrong.

Furthermore, by performing distribution fitting in Python, it was found that the age of individuals affected by catastrophic diseases, for both sexes, follows a **Log-Gamma** distribution with parameters c=2.33412, loc=42.3733, scale=21.6516 for male and c=4.18843, loc=15.3652, scale=30.297. The selection of this distribution was based on minimizing the Residual Sum of Squares (RSS). The histogram of the data along with the fitted values can be seen in the image below.

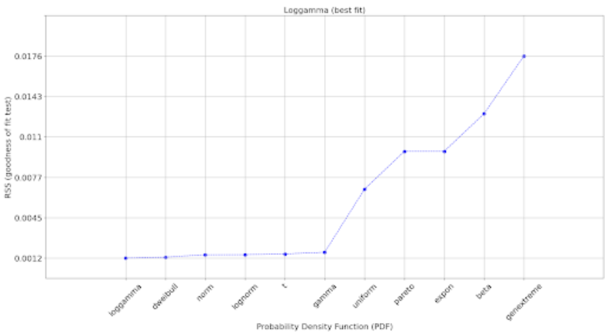

Figure 2. RSS of Fitted Distribution for Male

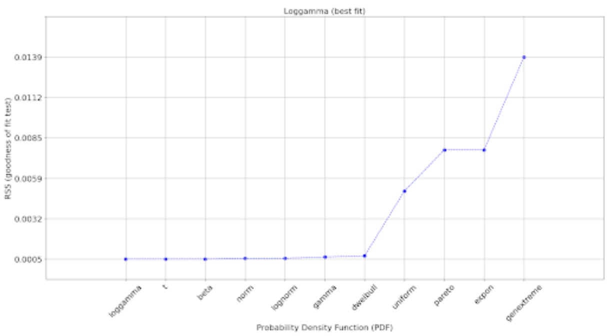

Figure 3. RSS of Fitted Distribution for Female

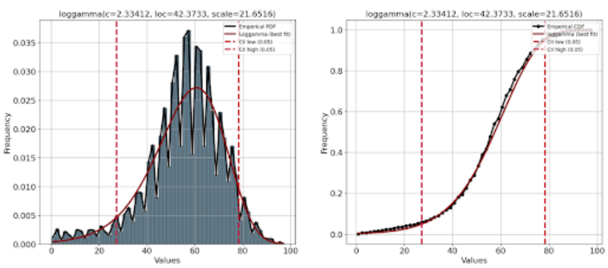

Figure 4. Fitting Distribution for Male

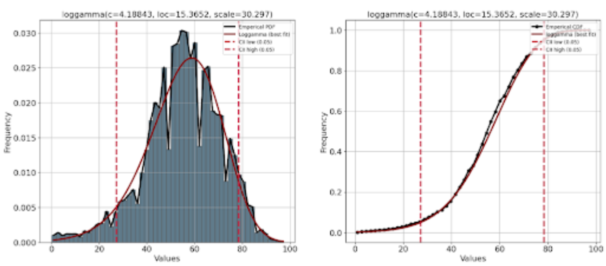

Figure 5. Fitting Distribution for Female

It was found from **Figure 6** that the survival rates for both sex do not show any significant differences. However, upon further examination, the graph indicates that the survival rate for females is lower than that of males between the ages of approximately 27 to 75. Therefore, it can be concluded that females have a higher probability of being affected by catastrophic diseases compared to males. After obtaining the Survival function, the morbidity tables for both sexes can be constructed assuming an interest rate of 6%, as detailed in the appendix section.

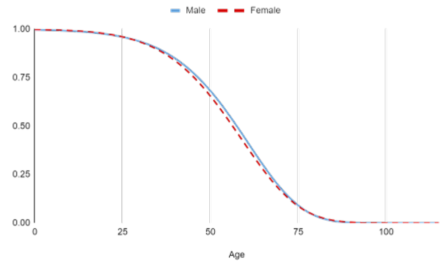

Figure 6. Survival Function for Each Sex

4.2 Average Hospitalized Cost

The provision of services for catastrophic non-communicable diseases entails long-term and recurring utilization, leading to a substantial financial burden on BPJS Kesehatan. Analyzing data samples from BPJS Kesehatan for the years 2015-2016 revealed that the total hospital tariffs for 8 catastrophic non-communicable diseases, as indicated in the table, had an average tariff amounting to **IDR 7,509,093**.

Table 1. Average Hospitalized Cost

Diseases	Number of Patients	Total Cost of Hospital
Leukemia	180	2,407,924,700.00
Stroke	2646	6,688,406,450.00
Kidney Failure	1495	15,888,622,600.00
Heart Disease	9522	68,321,444,316.00
Cancer	2903	24,229,414,476.00
Chirrhosis Hepatic	609	3,211,335,800.00
Thalassemia	165	9,526,212,301.00
Hemophilia	28	1,496,206,200.00
Total	17548	131,769,566,843.00
Average Cost of Hospital		7,509,093.16

4.3 Net Premium Calculation

In this paper, we conducted two types of calculations to determine premiums in health insurance "renewed every-year" and "not renewed every-year" premiums for each sex. In the probability calculations, this paper assumes the use of a previously compiled morbidity table for all probability calculations. It was also obtained in the previous subsection that the average hospitalized cost, based on the data, is **IDR 7,509,093**. In this calculation, we will determine the premium for a 50-year-old participant with a 20-year term policy.

4.3.1 Renewed Every-year Net Premium

For the ***first*** calculation, consider the age of health insurance participants is 50, the average hospitalized cost for one year is IDR 7,509,093, and assumed that the policy has a term of 20 years. Using equation (6), the results of the calculation for ***male*** are as follows:

- 1st year, at the age of 50:
  Based on constructed Morbidity Table, obtained values of commutation: $\bar{D}_{50} = 82.94$; $N_{50} = 220.33$; $N_{51} = 134.94$; and probability $q_{50} = 0.318594$; so it is obtained that :
  $P = 7,509,093 \times \frac{\bar{D}_{50}q_{51}}{N_{50}-N_{51}} = 7,509,093 \times \frac{82.94 \times 0.318594}{220.33-134.94}$
  $P = 2,323,662.99$

- 2nd year, at the age of 51:
  Based on constructed Morbidity Table, obtained values of commutation: $\bar{D}_{51} = 53.31$; $N_{51} = 134.94$; $N_{52} = 80.05$; and probability $q_{51} = 0.340315$; so it is obtained that :
  $P = 7,509,093 \times \frac{\bar{D}_{51}q_{51}}{N_{51}-N_{52}} = 7,509,093 \times \frac{53.31 \times 0.340315}{134.94-80.05}$
  $P = 2,482,078.38$

- For the 3rd year and onwards until the 20th year, the same calculation is performed, and the results can be seen in Table 2

For the ***second*** calculation, consider the age of health insurance participants is 50, the average hospitalized cost for one year is IDR 7,509,093, and assumed that the policy has a term of 20 years. Using equation (6), the results of the calculation for ***female*** are as follows:

- *1st* year, at the age of 50:
  Based on constructed Morbidity Table, obtained values of commutation: $\bar{D}_{50} = 62.66$; $N_{50} = 156.79$; $N_{51} = 92.28$; and probability $q_{50} = 0.345579$; so it is obtained that :
  $P = 7,509,093 \times \frac{\bar{D}_{50}q_{51}}{N_{50}-N_{51}} = 7,509,093 \times \frac{62.66 \times 0.345579}{156.79-92.28}$
  $P = 2,520,478$

- *2nd* year, at the age of 51:
  Based on constructed Morbidity Table, obtained values of commutation: $\bar{D}_{51} = 38.68$; $N_{51} = 92.28$; $N_{52} = 52.45$; and probability $q_{51} = 0.368488$; so it is obtained that :
  $P = 7,509,093 \times \frac{\bar{D}_{51}q_{51}}{N_{51}-N_{52}} = 7,509,093 \times \frac{38.68 \times 0.368488}{92.28-52.45}$
  $P = 2,687,565$

- For the *3rd* year and onwards until the *20th* year, the same calculation is performed, and the results can be seen in Table 2

From **Table 2** and **Figure 7**, it can be observed that the premium to be paid by the insurer increases every year due to the increase in the probability of them experiencing diseases over time. It can also be seen from the graph that females will pay higher premiums compared to males because their probability of experiencing diseases is higher than that of males.

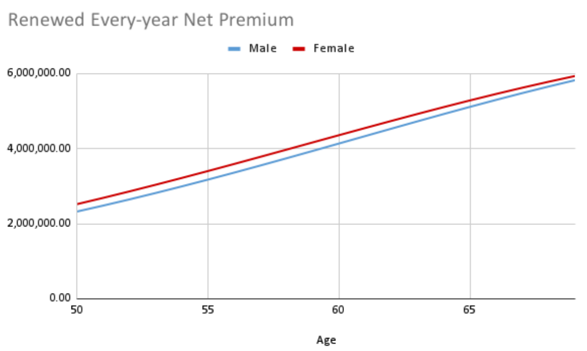

Figure 7. Renewed Every-year Net Premium

Table 2. Renewed Every-year Net Premium

Year	Age (Years)	The Amount of Premium (IDR)	
		Male	Female
1	50	2,323,662.99	2,520,478.39
2	51	2,482,078.38	2,687,564.78
3	52	2,646,791.98	2,859,949.95
4	53	2,817,498.16	3,037,164.53
5	54	2,993,813.45	3,218,669.04
6	55	3,175,273.84	3,403,855.71
7	56	3,361,333.23	3,592,051.80
8	57	3,551,363.45	3,782,524.28
9	58	3,744,655.86	3,974,486.16
10	59	3,940,424.88	4,167,104.31
11	60	4,137,813.51	4,359,508.79
12	61	4,335,901.09	4,550,803.52
13	62	4,533,713.12	4,740,078.24
14	63	4,730,233.47	4,926,421.49
15	64	4,924,418.55	5,108,934.36
16	65	5,115,213.52	5,286,744.65
17	66	5,301,570.05	5,459,021.23
18	67	5,482,465.44	5,624,988.03
19	68	5,656,922.40	5,783,937.45
20	69	5,824,103.73	5,935,242.59

4.3.2 Not Renewed Every-year Net Premium

For the ***first*** calculation, consider the age of health insurance participants is 50, the average hospitalized cost for one year is IDR 7,509,093, and assumed that the policy has a term of 20 years. Using equation (7), the results of the calculation for ***male*** are as follows:
Based on constructed Morbidity Table, obtained values of commutation: $\bar{D}_{50} = 82.94; \ldots; \bar{D}_{69} = 0.0000034$; $N_{50} = 220.33; \ldots; N_{69} = 0.0000043$; and probability $q_{50} = 0.318594; \ldots; q_{69} = 0.798525$; so it is obtained that :
$P = \frac{7,509,093}{220.33-0.0000043}(82.94 \times 0.318594) + \cdots + (0.0000034 \times 0.798525)$
$P = 2,558,526.75$
with total amount of premiums to be paid is IDR 2,558,527 $\times$ 20 years = IDR 51,170,525.40

For the ***second*** calculation, consider the age of health insurance participants is 50, the average hospitalized cost for one year is IDR 7,509,093, and assumed that the policy has a term of 20 years. Using equation (7), the results of the calculation for ***female*** are as follows:
Based on constructed Morbidity Table, obtained values of commutation : $\bar{D}_{50} = 62.66; \ldots; \bar{D}_{69} = 0.00000072$; $N_{50} = 156.79; \ldots; N_{69} = 0.0000009$; and probability $q_{50} = 0.345579; \ldots; q_{69} = 0.8137742$; so it is obtained that :
$P = \frac{7,509,093}{156.79-0.0000009}(62.66 \times 0.345579) + \cdots + (0.00000072 \times 0.8137742)$
$P = 2,743,398.08$
with total amount of premiums to be paid is IDR 2,743,398.08 $\times$ 20 years = IDR 54,867,960.00
For a 20-year policy term, starting at the age of 50, the calculation of premiums that are not renewed every year results in a **constant** premium. For males, the premium to be paid is IDR **2,558,526.75** and for females is IDR **2,743,398.08**. Females will pay a higher premium because as mentioned earlier, they have a greater probability of experiencing catastrophic

diseases.

Based on the calculations above, it can be concluded that females will pay higher premiums due to their higher probability of experiencing catastrophic diseases. This is based on the previously constructed morbidity table. Additionally, using different calculation methods will result in different premiums being charged to the insurer. The calculation of premiums that are renewed every year yields a higher total compared to premiums that are not renewed every year. The comparison between the two can be seen in the table below:

Table 3. Net Premium Comparisons

Sex	Renewed Every-Year	Not Renewed Every-year
Male	IDR81,079,251.12	IDR51,170,534.91
Female	IDR85,019,529.30	IDR54,867,961.65

5 Conclusions

Based on the survival function graphs for males and females, we can infer that females have a lower survival rate for contracting one of eight catastrophic diseases than males. Therefore, females are more susceptible to these diseases. The total premium amount renewed annually is greater than the premium amount not renewed each year. Additionally, the premium for females is consistently higher than that for males due to the higher probability of females getting diseases as indicated by the morbidity table. The advantage of renewing the premium every year is that it results in a larger claim reserve for the insurance company. However, the disadvantage is that the insured individual will have to pay more each year compared to the previous year. On the other hand, with a premium not renewed every year, the insurance company maintains a constant claim reserve, and the insured individual pays a consistent amount annually and cheaper charges. The use of morbidity table instead of mortality table to calculate the premium is more accurate and representative because the morbidity table holds the information about someone getting sick but not necessarily die, whereas the mortality table only holds the information about persons die. In the future, models that use morbidity table and mortality table together can be developed and this method is believed to be the most accurate compared to using morbidity table alone or mortality table alone.

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APPENDIX

Table 4. Morbidity Table for Male

Age	q_x	p_x	l_x	d_x	D_x	N_x	$\bar{D}_x$
0	0.003382906	0.996617094	100000	338.2905576	100000	1393150.662	97128.58624
1	0.003750581	0.996249419	99661.70944	373.7893409	94020.48061	1293150.662	91320.76358
2	0.004157319	0.995842681	99287.9201	412.7715205	88365.89543	1199130.181	85828.54494
3	0.004607122	0.995392878	98875.14858	455.5298889	83017.48136	1110764.286	80633.70597
4	0.005104383	0.994895617	98419.61869	502.3714751	77957.5563	1027746.805	75719.0723
5	0.005653915	0.994346085	97917.24722	553.6157829	73169.46325	949789.2483	71068.46521
6	0.006260985	0.993739015	97363.63143	609.5922826	68637.51823	876619.785	66666.65109
7	0.006931359	0.993068641	96754.03915	670.6370034	64346.96201	807982.2668	62499.29449
8	0.007671336	0.992328664	96083.40215	737.0880517	60283.91519	743635.3048	58552.91455
9	0.008487794	0.991512206	95346.3141	809.279864	56435.33682	683351.3896	54814.84479
10	0.009388236	0.990611764	94537.03423	887.5359854	52788.98614	626916.0528	51273.19593
11	0.010380837	0.989619163	93649.49825	972.1601514	49333.38744	574127.0666	47916.82176
12	0.011474493	0.988525507	92677.3381	1063.425444	46057.79773	524793.6792	44735.28779
13	0.012678874	0.987321126	91613.91265	1161.561297	42952.17723	478735.8815	41718.8425
14	0.01400448	0.98599552	90452.35135	1266.738139	40007.16223	435783.7042	38858.39107
15	0.01546269	0.98453731	89185.61322	1379.049501	37214.04031	395776.542	36145.47124
16	0.017065825	0.982934175	87806.56371	1498.491475	34564.72749	358562.5017	33572.23115
17	0.018827202	0.981172798	86308.07224	1624.939496	32051.74707	323997.7742	31131.40879
18	0.020761189	0.979238811	84683.13274	1758.122564	29668.20977	291946.0271	28816.31271
19	0.022883267	0.977116733	82925.01018	1897.595177	27407.79476	262277.8174	26620.80357
20	0.025210079	0.974789921	81027.415	2042.707517	25264.73101	234870.0226	24539.27604
21	0.027759484	0.972240516	78984.70749	2192.574685	23233.77844	209605.2916	22566.64053
22	0.030550606	0.969449394	76792.1328	2346.046171	21310.20825	186371.5132	20698.304
23	0.033603877	0.966396123	74446.08663	2501.677164	19489.78159	165061.3049	18930.14932
24	0.036941074	0.963058926	71944.40947	2657.703784	17768.72581	145571.5233	17258.51217
25	0.040585345	0.959414655	69286.70568	2812.024838	16143.70754	127802.7975	15680.1549
26	0.044561225	0.955438775	66474.68084	2962.19323	14611.80151	111659.09	14192.23623
27	0.048894646	0.951105354	63512.48761	3105.420612	13170.45446	97047.28847	12792.27622
28	0.05361292	0.94638708	60407.067	3238.599254	11817.44316	83876.834	11478.11547
29	0.058744713	0.941255287	57168.46775	3358.345205	10550.82597	72059.39084	10247.8681
30	0.064319992	0.935680008	53810.12254	3461.066669	9368.88748	61508.56487	9099.867956
31	0.070369956	0.929630044	50349.05587	3543.060869	8270.076141	52139.67739	8032.608036
32	0.076926928	0.923073072	46805.99501	3600.641421	7252.935135	43869.60125	7044.673357
33	0.084024224	0.915975776	43205.35358	3630.296314	6316.027466	36616.66612	6134.668184
34	0.091695985	0.908304015	39575.05727	3628.873865	5457.856753	30300.63865	5301.139103
35	0.099976971	0.900023029	35946.18341	3593.790524	4676.786039	24842.7819	4542.496161
36	0.108902309	0.891097691	32352.39288	3523.250303	3970.957678	20165.99586	3856.935052
37	0.118507206	0.881492794	28829.14258	3416.461135	3338.218128	16195.03818	3242.364073
38	0.128826597	0.871173403	25412.68144	3273.829261	2776.052099	12856.82005	2696.340157
39	0.139894757	0.860105243	22138.85218	3097.109342	2281.530901	10080.76795	2216.018709
40	0.151744852	0.848255148	19041.74284	2889.486458	1851.279897	7799.237053	1798.121991
41	0.164408438	0.835591562	16152.25638	2655.567246	1481.46953	5947.957156	1438.93041
42	0.1779149	0.8220851	13496.68914	2401.262103	1167.833432	4466.487626	1134.300102
43	0.192290846	0.807709154	11095.42703	2133.549051	905.7155317	3298.654194	879.7086913
44	0.207559442	0.792440558	8961.877982	1860.122389	690.1459678	2392.938662	670.3290215
45	0.223739704	0.776260296	7101.755593	1588.944693	515.9430718	1702.792694	501.1282115
46	0.240845753	0.759154247	5512.8109	1327.73709	377.8359639	1186.849623	366.98673
47	0.258886031	0.741113969	4185.07381	1083.457146	270.5997895	809.0136587	262.8297499
48	0.277862505	0.722137495	3101.616663	861.8229763	189.1936642	538.4138692	183.7611313
49	0.297769864	0.702230136	2239.793687	666.9430626	128.8904139	349.220205	125.1894368
50	0.318594725	0.681405275	1572.850624	501.1019128	85.38748379	220.3297911	82.93565582
51	0.340314875	0.659685125	1071.748712	364.7320284	54.89007721	134.9423073	53.31395597
52	0.362898564	0.637101436	707.0166833	256.5753394	34.16053534	80.05223013	33.17964503
53	0.38630389	0.61369611	450.4413439	174.0072432	20.53181708	45.89169479	19.94226366
54	0.410478274	0.589521726	276.4341007	113.4701926	11.88707196	25.3598777	11.54574494
55	0.435358097	0.564641903	162.9639081	70.94765682	6.611025639	13.47280574	6.421195738
56	0.460868483	0.539131517	92.01625124	42.40739013	3.521568019	6.861780099	3.42044923
57	0.486923305	0.513076695	49.60886111	24.15571061	1.791121045	3.34021208	1.739690549

Age	q_x	p_x	l_x	d_x	D_x	N_x	$\bar{D}_x$
58	0.513425402	0.486574598	25.45315051	13.06829402	0.866964591	1.549091035	0.84207045
59	0.540267063	0.459732937	12.38485648	6.69113004	0.397965045	0.682126444	0.386537822
60	0.567330789	0.432669211	5.693726441	3.230226317	0.172601546	0.284161399	0.167645441
61	0.594490346	0.405509654	2.463500124	1.464527041	0.07045224	0.111559853	0.068429265
62	0.621612124	0.378387876	0.998973083	0.620973779	0.026951947	0.041107613	0.026178045
63	0.648556799	0.351443201	0.377999304	0.245154018	0.009621028	0.014155666	0.009344769
64	0.67518129	0.32481871	0.132845285	0.089694651	0.003189854	0.004534638	0.00309826
65	0.701340965	0.298659035	0.043150634	0.030263307	0.000977476	0.001344784	0.000949408
66	0.726892092	0.273107908	0.012887327	0.009367696	0.000275407	0.000367308	0.000267499
67	0.751694449	0.248305551	0.003519631	0.002645687	7.09585E-05	9.19008E-05	6.89209E-05
68	0.775614039	0.224385961	0.000873944	0.000677843	1.66221E-05	2.09424E-05	1.61448E-05
69	0.798525838	0.201474162	0.000196101	0.000156592	3.51864E-06	4.32034E-06	3.4176E-06
70	0.820316469	0.179683531	3.95092E-05	3.24101E-05	6.68787E-07	8.01704E-07	6.49584E-07
71	0.840886711	0.159113289	7.09916E-06	5.96959E-06	1.13368E-07	1.32917E-07	1.10113E-07
72	0.860153755	0.139846245	1.12957E-06	9.71604E-07	1.70173E-08	1.95488E-08	1.65287E-08
73	0.878053075	0.121946925	1.57966E-07	1.38703E-07	2.2451E-09	2.53145E-09	2.18064E-09
74	0.894539864	0.105460136	1.92635E-08	1.7232E-08	2.58286E-10	2.86344E-10	2.5087E-10
75	0.909589915	0.090410085	2.03153E-09	1.84786E-09	2.56971E-11	2.80578E-11	2.49592E-11
76	0.923199922	0.076800078	1.83671E-10	1.69565E-10	2.19177E-12	2.36076E-12	2.12883E-12
77	0.935387137	0.064612863	1.41059E-11	1.31945E-11	1.588E-13	1.68992E-13	1.5424E-13
78	0.946188407	0.053811593	9.11425E-13	8.6238E-13	9.67973E-15	1.01924E-14	9.40179E-15
79	0.955658583	0.044341417	4.90452E-14	4.68705E-14	4.91398E-16	5.12674E-16	4.77288E-16
80	0.963868393	0.036131607	2.17473E-15	2.09616E-15	2.05559E-17	2.12763E-17	1.99657E-17
81	0.970901843	0.029098157	7.85767E-17	7.62902E-17	7.00678E-19	7.2034E-19	6.80559E-19
82	0.976853276	0.023146724	2.28644E-18	2.23351E-18	1.92344E-20	1.96617E-20	1.86821E-20
83	0.981824217	0.018175783	5.29235E-20	5.19616E-20	4.20012E-22	4.27311E-22	4.07952E-22
84	0.985920159	0.014079841	9.61926E-22	9.48382E-22	7.20193E-24	7.29857E-24	6.99513E-24
85	0.989247434	0.010752566	1.35438E-23	1.33981E-23	9.56623E-26	9.66401E-26	9.29154E-26
86	0.991910318	0.008089682	1.4563E-25	1.44452E-25	9.70392E-28	9.7784E-28	9.42528E-28
87	0.99400848	0.00599152	1.1781E-27	1.17104E-27	7.40581E-30	7.44785E-30	7.19316E-30
88	0.995634888	0.004365112	7.05862E-30	7.02781E-30	4.18604E-32	4.20333E-32	4.06585E-32
89	0.996874225	0.003125775	3.08117E-32	3.07154E-32	1.72383E-34	1.72892E-34	1.67433E-34
90	0.997801841	0.002198159	9.63104E-35	9.60987E-35	5.08329E-37	5.09385E-37	4.93733E-37
91	0.998483238	0.001516762	2.11705E-37	2.11384E-37	1.05414E-39	1.05565E-39	1.02387E-39
92	0.998974033	0.001025967	3.21107E-40	3.20777E-40	1.50838E-42	1.50984E-42	1.46507E-42
93	0.999320345	0.000679655	3.29445E-43	3.29221E-43	1.45995E-45	1.46088E-45	1.41803E-45
94	0.999559501	0.000440499	2.23909E-46	2.2381E-46	9.36095E-49	9.36484E-49	9.09216E-49
95	0.999720973	0.000279027	9.86317E-50	9.86042E-50	3.89009E-52	3.89111E-52	3.77839E-52
96	0.999827451	0.000172549	2.75209E-53	2.75162E-53	1.024E-55	1.02417E-55	9.94596E-56
97	0.99989595	0.00010405	4.7487E-57	4.7482E-57	1.66688E-59	1.66705E-59	1.61902E-59
98	0.999938891	6.11092E-05	4.941E-61	4.94069E-61	1.63621E-63	1.63631E-63	1.58923E-63
99	0.999965089	3.49109E-05	3.0194E-65	3.0193E-65	9.43279E-68	9.4331E-68	9.16194E-68
100	0.999980626	1.93745E-05	1.0541E-69	1.05408E-69	3.10667E-72	3.10673E-72	3.01747E-72
101	0.999989569	1.04306E-05	2.04226E-74	2.04224E-74	5.67831E-77	5.67837E-77	5.51527E-77
102	0.99999456	5.43962E-06	2.1302E-79	2.13019E-79	5.58756E-82	5.58759E-82	5.42712E-82
103	0.999997256	2.74378E-06	1.15875E-84	1.15875E-84	2.86738E-87	2.86739E-87	2.78504E-87
104	0.999998664	1.33648E-06	3.17935E-90	3.17935E-90	7.42214E-93	7.42215E-93	7.20902E-93
105	0.999999372	6.27595E-07	4.24913E-96	4.24913E-96	9.35803E-99	9.35803E-99	9.08932E-99
106	0.999999716	2.83627E-07	2.66673E-102	2.66673E-102	5.54061E-105	5.54062E-105	5.38152E-105
107	0.999999877	1.23133E-07	7.56358E-109	7.56358E-109	1.48252E-111	1.48252E-111	1.43995E-111
108	0.999999949	5.12538E-08	9.31323E-116	9.31323E-116	1.72213E-118	1.72213E-118	1.67268E-118
109	0.99999998	2.04144E-08	4.77339E-123	4.77339E-123	8.32698E-126	8.32698E-126	8.08787E-126
110	0.999999992	7.76421E-09	9.7446E-131	9.7446E-131	1.60368E-133	1.60368E-133	1.55764E-133
111	0.999999997	2.81354E-09	7.56591E-139	7.56591E-139	1.17465E-141	1.17465E-141	1.14092E-141
112	0.999999999	9.69187E-10	2.1287E-147	2.1287E-147	3.11786E-150	3.11786E-150	3.02834E-150
113	1	3.16604E-10	2.06311E-156	2.06311E-156	2.85075E-159	2.85075E-159	2.76889E-159
114	1	9.7833E-11	6.53188E-166	6.53188E-166	8.5147E-169	8.5147E-169	8.27021E-169
115	1	2.8522E-11	6.39034E-176	6.39034E-176	7.85867E-179	7.85867E-179	7.63302E-179

Table 5. Morbidity Table for Female

Age	q_x	p_x	l_x	d_x	D_x	N_x	$\bar{D}_x$
0	0.002308118	0.997691882	100000	230.8118341	100000	1412623.179	97128.58624
1	0.002608284	0.997391716	99769.18817	260.2263707	94121.87563	1312623.179	91419.24714
2	0.00294594	0.99705406	99508.9618	293.1474256	88562.62175	1218501.303	86019.62244
3	0.003325507	0.996674493	99215.81437	329.9428891	83303.51093	1129938.682	80911.52245
4	0.003751883	0.996248117	98885.87148	371.0082544	78326.87218	1046635.171	76077.78359
5	0.004230489	0.995769511	98514.86323	416.7660243	73616.03669	968308.2986	71502.21568
6	0.004767312	0.995232688	98098.0972	467.6642643	69155.28762	894692.2619	67169.55317
7	0.005368962	0.994631038	97630.43294	524.1740739	64929.81393	825536.9743	63065.41032
8	0.006042718	0.993957282	97106.25886	586.7857069	60925.66815	760607.1603	59176.24012
9	0.006796587	0.993203413	96519.47316	656.0030326	57129.72786	699681.4922	55489.29699
10	0.007639364	0.992360636	95863.47012	732.3359874	53529.66101	642551.7643	51992.60296
11	0.008580689	0.991419311	95131.13414	816.2906304	50113.89474	589022.1033	48674.91747
12	0.009631107	0.990368893	94314.84351	908.356382	46871.58775	538908.2086	45525.71053
13	0.010802141	0.989197859	93406.48712	1008.990006	43792.60609	492036.6208	42535.13918
14	0.012106344	0.987893656	92397.49712	1118.595894	40867.50208	448244.0147	39694.027
15	0.013557374	0.986442626	91278.90122	1237.502231	38087.49626	407376.5126	36993.84665
16	0.015170052	0.984829948	90041.39899	1365.932708	35444.46209	369289.0164	34426.70493
17	0.016960424	0.983039576	88675.46629	1503.97352	32930.91298	333844.5543	31985.33021
18	0.018945823	0.981054177	87171.49277	1651.535637	30539.99125	300913.6413	29663.06174
19	0.021144919	0.978855081	85519.95713	1808.312539	28265.45849	270373.65	27453.84022
20	0.023577772	0.976422228	83711.64459	1973.734038	26101.68648	242108.1915	25352.19906
21	0.026265869	0.973734131	81737.91055	2146.917263	24043.648	216006.5051	23353.25538
22	0.029232158	0.970767842	79590.99329	2326.616524	22086.90631	191962.8571	21452.69984
23	0.032501065	0.967498935	77264.37677	2511.174513	20227.60223	169875.9508	19646.78407
24	0.036098496	0.963901504	74753.20225	2698.478181	18462.43738	149648.3485	17932.30441
25	0.04005183	0.95994817	72054.72407	2885.923575	16788.65203	131185.9112	16306.58036
26	0.044389882	0.955610118	69168.8005	3070.394884	15203.99603	114397.2591	14767.42639
27	0.049142847	0.950857153	66098.40561	3248.263852	13706.69098	99193.2631	13313.11517
28	0.054342222	0.945657778	62850.14176	3415.416368	12295.38223	85486.57212	11942.33093
29	0.060020691	0.939979309	59434.72539	3567.313279	10969.07909	73191.1899	10654.11144
30	0.066211982	0.933788018	55867.41211	3699.092109	9727.082437	62222.11081	9447.777653
31	0.072950692	0.927049308	52168.32001	3805.715019	8568.899081	52495.02837	8322.850533
32	0.08027206	0.91972794	48362.60499	3882.165937	7494.143365	43926.12929	7278.955501
33	0.088211718	0.911788282	44480.43905	3923.695953	6502.427395	36431.98593	6315.715799
34	0.096805379	0.903194621	40556.7431	3926.110902	5593.242549	29929.55853	5432.637413
35	0.106088492	0.893911508	36630.63219	3886.088537	4765.836398	24336.31598	4628.989516
36	0.116095843	0.883904157	32744.54366	3801.505387	4019.090567	19570.47959	3903.685847
37	0.12686111	0.87313889	28943.03827	3671.745959	3351.406473	15551.38902	3255.173726
38	0.138416375	0.861583625	25271.29231	3497.960666	2760.606913	12199.98255	2681.338466
39	0.150791582	0.849208418	21773.33165	3283.235119	2243.861992	9439.375633	2179.43143
40	0.16401396	0.83598604	18490.09653	3032.633951	1797.647635	7195.513641	1746.029734
41	0.178107404	0.821892596	15457.46258	2753.088534	1417.743706	5397.866006	1377.034418
42	0.193091825	0.806908175	12704.37404	2453.110773	1099.276466	3980.1223	1067.711691
43	0.208982476	0.791017524	10251.26327	2142.334377	836.8067614	2880.845833	812.7785768
44	0.225789261	0.774210739	8108.928891	1830.909061	624.461144	2044.039072	606.5302808
45	0.243516048	0.756483952	6278.01983	1528.798579	456.0986074	1419.577928	443.0021292
46	0.262159986	0.737840014	4749.221251	1245.055776	325.5012047	963.4793206	316.1547183
47	0.281710851	0.718289149	3504.165475	987.1614387	226.5734089	637.9781159	220.0675489
48	0.302150439	0.697849561	2517.004036	760.5138745	153.5332274	411.404707	149.1246532
49	0.323452016	0.676547984	1756.490161	568.1402834	101.0783918	257.8714796	98.17601296
50	0.345579855	0.654420145	1188.349878	410.6697782	64.51356814	156.7930878	62.66111667
51	0.368488875	0.631511125	777.6800998	286.5664653	39.82922513	92.27951967	38.68556328
52	0.392124405	0.607875595	491.1136346	192.5776419	23.72886675	52.45029454	23.04751281
53	0.41642209	0.58357791	298.5359926	124.316982	13.60773489	28.72142778	13.21700052
54	0.441307961	0.558692039	174.2190107	76.88423638	7.491673105	15.11369289	7.276556172
55	0.466698691	0.533301309	97.33477429	45.42601173	3.94862087	7.622019783	3.835239626
56	0.492502037	0.507497963	51.90876256	25.56517131	1.986608188	3.673398913	1.929564447
57	0.518617497	0.481382503	26.34359125	13.66224735	0.951131706	1.686790725	0.923820779
58	0.544937166	0.455062834	12.68134391	6.910535611	0.431941662	0.735659019	0.41953883
59	0.571346817	0.428653183	5.770808297	3.29713295	0.185434525	0.303717357	0.180109933
60	0.59772717	0.40227283	2.473675347	1.478582965	0.07498783	0.118282832	0.072834619

Age	q_x	p_x	l_x	d_x	D_x	N_x	$\bar{D}_x$
61	0.623955367	0.376044633	0.995092382	0.620893232	0.028458082	0.043295002	0.027640932
62	0.649906604	0.350093396	0.374199149	0.243194498	0.010095763	0.01483692	0.009805872
63	0.675455911	0.324544089	0.131004651	0.088487866	0.003334396	0.004741157	0.003238652
64	0.700480038	0.299519962	0.042516785	0.029782159	0.001020904	0.001406761	0.00099159
65	0.724859399	0.275140601	0.012734626	0.009230813	0.000288473	0.000385857	0.00028019
66	0.74848004	0.25151996	0.003503813	0.002622534	7.48779E-05	9.73838E-05	7.27279E-05
67	0.771235555	0.228764445	0.000881279	0.000679674	1.77673E-05	2.25059E-05	1.72571E-05
68	0.793028925	0.206971075	0.000201605	0.000159879	3.83445E-06	4.73865E-06	3.72435E-06
69	0.813774195	0.186225805	4.17265E-05	3.39559E-05	7.48698E-07	9.04196E-07	7.272E-07
70	0.833397955	0.166602045	7.77054E-06	6.47595E-06	1.31535E-07	1.55498E-07	1.27758E-07
71	0.851840555	0.148159445	1.29459E-06	1.10278E-06	2.06736E-08	2.39628E-08	2.00799E-08
72	0.869057032	0.130942968	1.91805E-07	1.6669E-07	2.88961E-09	3.28927E-09	2.80663E-09
73	0.885017691	0.114982309	2.51156E-08	2.22277E-08	3.56956E-10	3.99663E-10	3.46707E-10
74	0.899708329	0.100291671	2.88785E-09	2.59822E-09	3.87204E-11	4.27067E-11	3.76086E-11
75	0.913130085	0.086869915	2.89627E-10	2.64467E-10	3.66353E-12	3.98626E-12	3.55833E-12
76	0.925298919	0.074701081	2.51599E-11	2.32804E-11	3.00236E-13	3.22735E-13	2.91615E-13
77	0.936244729	0.063755271	1.87947E-12	1.75964E-12	2.11584E-14	2.24987E-14	2.05509E-14
78	0.946010149	0.053989851	1.19826E-13	1.13357E-13	1.27261E-15	1.3403E-15	1.23606E-15
79	0.954649055	0.045350945	6.46939E-15	6.176E-15	6.48187E-17	6.76937E-17	6.29575E-17
80	0.962224853	0.037775147	2.93393E-16	2.8231E-16	2.7732E-18	2.875E-18	2.69357E-18
81	0.968808589	0.031191411	1.1083E-17	1.07373E-17	9.88282E-20	1.01808E-19	9.59905E-20
82	0.974476975	0.025523025	3.45693E-19	3.3687E-19	2.90811E-21	2.97952E-21	2.8246E-21
83	0.979310382	0.020689618	8.82314E-21	8.6406E-21	7.00223E-23	7.14107E-23	6.80117E-23
84	0.983390887	0.016609113	1.82547E-22	1.79515E-22	1.36673E-24	1.38842E-24	1.32749E-24
85	0.986800427	0.013199573	3.03195E-24	2.99193E-24	2.14153E-26	2.16846E-26	2.08004E-26
86	0.989619129	0.010380871	4.00205E-26	3.9605E-26	2.66672E-28	2.69304E-28	2.59015E-28
87	0.991923851	0.008076149	4.15447E-28	4.12092E-28	2.61159E-30	2.63161E-30	2.5366E-30
88	0.993786986	0.006213014	3.35521E-30	3.33437E-30	1.98978E-32	2.00149E-32	1.93264E-32
89	0.995275525	0.004724475	2.0846E-32	2.07475E-32	1.16627E-34	1.17149E-34	1.13279E-34
90	0.996450411	0.003549589	9.84864E-35	9.81368E-35	5.19814E-37	5.21559E-37	5.04888E-37
91	0.997366155	0.002633845	3.49586E-37	3.48665E-37	1.74069E-39	1.74502E-39	1.6907E-39
92	0.998070705	0.001929295	9.20756E-40	9.18979E-40	4.32519E-42	4.33307E-42	4.20099E-42
93	0.99860554	0.00139446	1.77641E-42	1.77393E-42	7.87223E-45	7.88259E-45	7.64618E-45
94	0.99900595	0.00099405	2.47713E-45	2.47467E-45	1.03561E-47	1.03659E-47	1.00588E-47
95	0.999301455	0.000698545	2.46239E-48	2.46067E-48	9.71181E-51	9.71821E-51	9.43294E-51
96	0.999516331	0.000483669	1.72009E-51	1.71926E-51	6.40013E-54	6.40305E-54	6.21635E-54
97	0.999670204	0.000329796	8.31955E-55	8.31681E-55	2.92032E-57	2.92123E-57	2.83647E-57
98	0.999778663	0.000221337	2.74376E-58	2.74315E-58	9.08596E-61	9.08785E-61	8.82506E-61
99	0.999853871	0.000146129	6.07295E-62	6.07206E-62	1.89722E-64	1.89749E-64	1.84275E-64
100	0.999905149	9.48513E-05	8.87432E-66	8.87348E-66	2.61546E-68	2.6157E-68	2.54036E-68
101	0.999939505	6.04954E-05	8.41741E-70	8.4169E-70	2.34038E-72	2.34051E-72	2.27318E-72
102	0.999962111	3.78888E-05	5.09215E-74	5.09196E-74	1.33568E-76	1.33573E-76	1.29733E-76
103	0.999976712	2.32882E-05	1.92935E-78	1.92931E-78	4.77428E-81	4.77438E-81	4.63719E-81
104	0.999985962	1.40384E-05	4.49311E-83	4.49305E-83	1.04891E-85	1.04892E-85	1.01879E-85
105	0.999991706	8.29403E-06	6.3076E-88	6.30755E-88	1.38915E-90	1.38916E-90	1.34926E-90
106	0.999995201	4.79935E-06	5.23154E-93	5.23152E-93	1.08695E-95	1.08695E-95	1.05574E-95
107	0.999997282	2.71805E-06	2.5108E-98	2.51079E-98	4.92135E-101	4.92136E-101	4.78004E-101
108	0.999998495	1.50547E-06	6.82447E-104	6.82446E-104	1.26193E-106	1.26193E-106	1.2257E-106
109	0.999999185	8.14888E-07	1.0274E-109	1.0274E-109	1.79227E-112	1.79227E-112	1.7408E-112
110	0.999999569	4.30718E-07	8.3722E-116	8.3722E-116	1.37783E-118	1.37783E-118	1.33826E-118
111	0.999999778	2.2213E-07	3.60606E-122	3.60606E-122	5.59863E-125	5.59863E-125	5.43787E-125
112	0.999999888	1.1168E-07	8.01012E-129	8.01012E-129	1.17323E-131	1.17323E-131	1.13954E-131
113	0.999999945	5.46917E-08	8.94568E-136	8.94568E-136	1.23609E-138	1.23609E-138	1.2006E-138
114	0.999999974	2.60651E-08	4.89254E-143	4.89254E-143	6.37773E-146	6.37773E-146	6.1946E-146
115	0.999999988	1.20778E-08	1.27525E-150	1.27525E-150	1.56827E-153	1.56827E-153	1.52324E-153