

# TITANIC Survival Analysis

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# Introduction

The sinking of the RMS **Titanic** on April 15, 1912, is one of history's most infamous maritime tragedies, a disaster that has gripped hearts for more than a century. The ship, which was considered unsinkable, met its tragic fate in the North Atlantic Ocean, taking over 1,500 lives with it. However, not all lives were lost; many survived, and the factors that contributed to who lived and who perished have long been a source of interest and analysis.

In this project, I have used the Titanic dataset to analyze the survival factors. While the data is full of numbers and categories, I wanted to ensure that each data point is treated with respect, as behind every statistic was a real person—a life filled with dreams, hopes, and in many cases, a story that ended too soon.

Playing "Nearer My God to Thee," Carrying 1589 Souls Back to Their

of Ship's Company

# TITANIC

## History

The Story of the Disaster in

The Titanic set sail on its maiden voyage from Southampton, England, to New York City on April 10, 1912, carrying over 2,200 passengers and crew. The ship was the largest afloat at

the time, boasting opulence and advanced safety features, yet it carried only enough lifeboats for about half of those on board. In the early hours of April 15, after hitting an iceberg, the Titanic sank, leading to one of the deadliest peacetime maritime disasters.

The event, though tragic, opened up many discussions around human behavior in crisis, societal inequalities, and survival strategies. Today, analyzing the data behind this disaster allows us to reflect on how age, gender, class, and other factors impacted the fates of those on board.

# Objective

The objective of this project was to analyze the survival data from the Titanic disaster using Excel. By focusing on key variables such as passenger class, gender, age, family size, and boarding location, the aim was to understand the survival patterns that emerged from the chaos. Additionally, I sought to create visualizations and KPIs (Key Performance Indicators) to better represent the insights.

At the heart of this analysis lies one question: **What factors influenced who survived and who did not?**

# Titanic Methodology

In conducting this Titanic Survival Analysis, I followed a structured approach to ensure thorough insights from the data:

- **Data Cleaning:** Addressed missing values and standardized text fields.
- **Data Transformation:** Created new columns like Survived Status and Age Group for analysis.
- **Descriptive Analysis:** Used pivot tables to analyze survival by gender, class, and age group.
- **Visualizations:** Developed charts to illustrate survival trends.
- **KPIs:** Calculated key metrics such as Survival Rate and Class-Based Survival Rate.
- **Correlation Analysis:** Explored relationships between survival and factors like gender and class.
- **Recommended Analysis:** Analyzed survival by demographics for actionable insights.

This method ensured a focused and efficient analysis.

# 1. Which gender had a higher survival rate?

## Solution:

A breakdown of survival rates by gender shows that females had a higher survival rate compared to males.

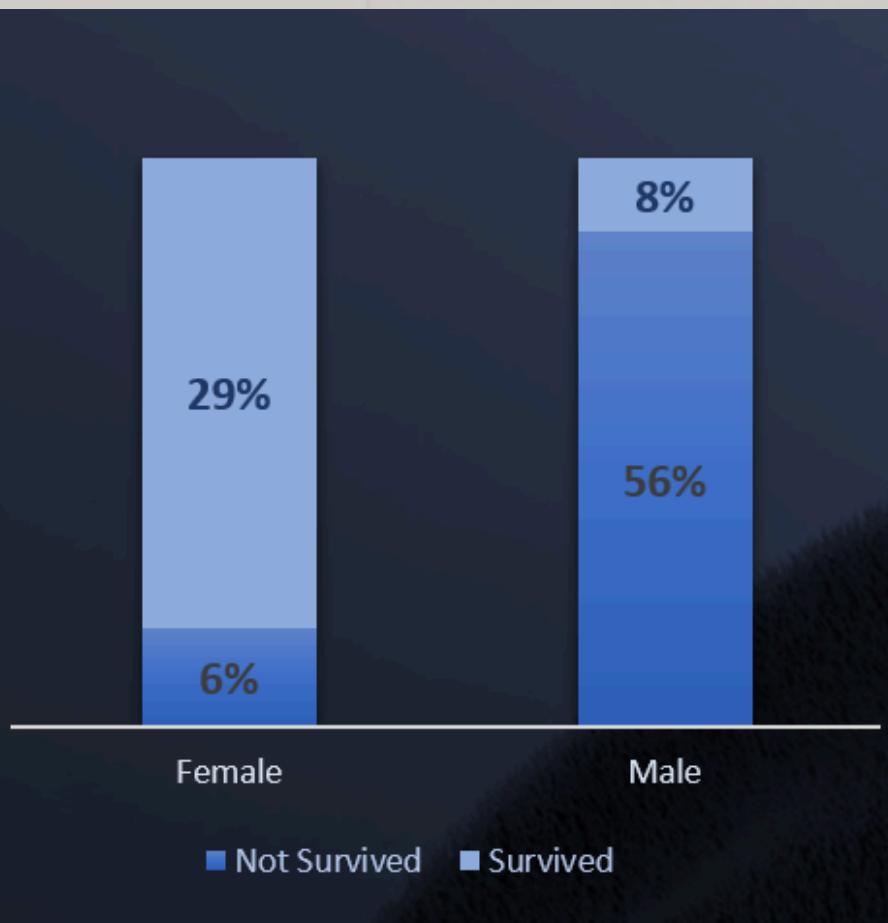
## Visualization:

The Column chart clearly shows that over 26% of female passengers survived, compared to less than 8% of male passengers.

## Key Insight:

Gender played a critical role, with women being prioritized for lifeboats, leading to their higher survival rates.

Boarded	Not Survived	Survived	Grand Total
Female	6%	29%	36%
Male	56%	8%	64%
<b>Grand Total</b>	<b>62%</b>	<b>38%</b>	<b>100%</b>



## 2. How did passenger class affect survival rates?

### Solution:

Analysis revealed that first-class passengers had a much higher survival rate than those in third class.

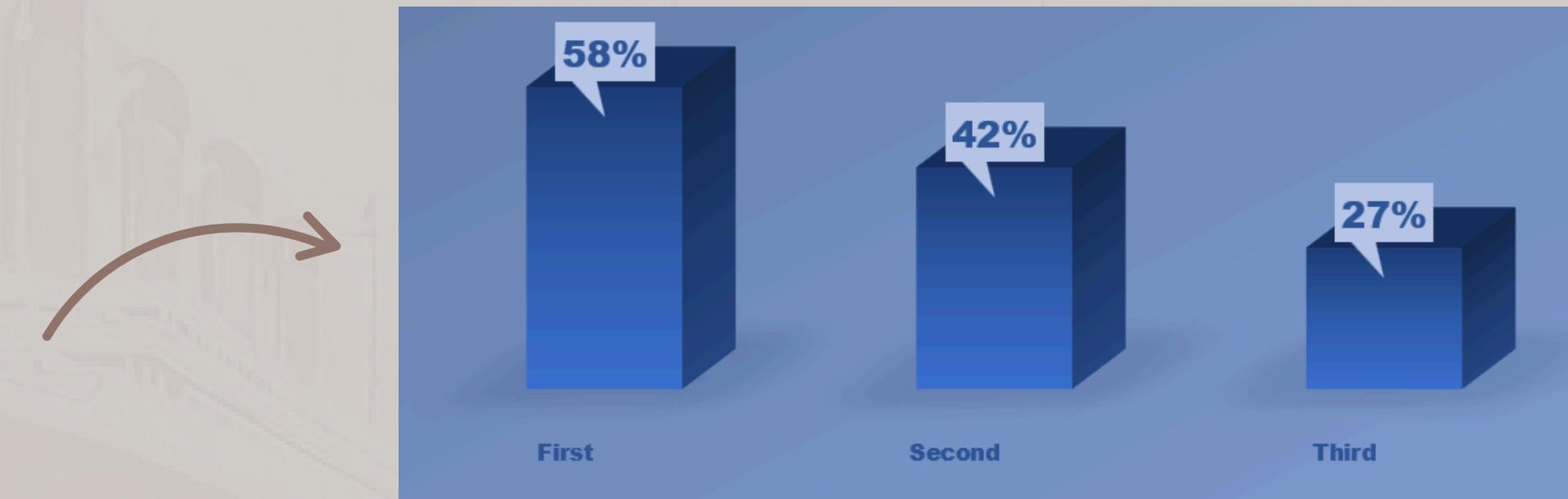
### Visualization:

A bar chart shows that 58% of first-class passengers survived, compared to only 27% in third class.

### Key Insight:

Economic status and social standing had a significant impact on survival, with wealthier passengers faring better.

Pclass	Average of Survived
First	58%
Second	42%
Third	27%
<b>Grand Total</b>	<b>38%</b>



### 3. What was the impact of age on survival?

#### Solution:

By categorizing passengers into age groups, I found that children had a higher chance of survival, while the elderly were less likely to survive.

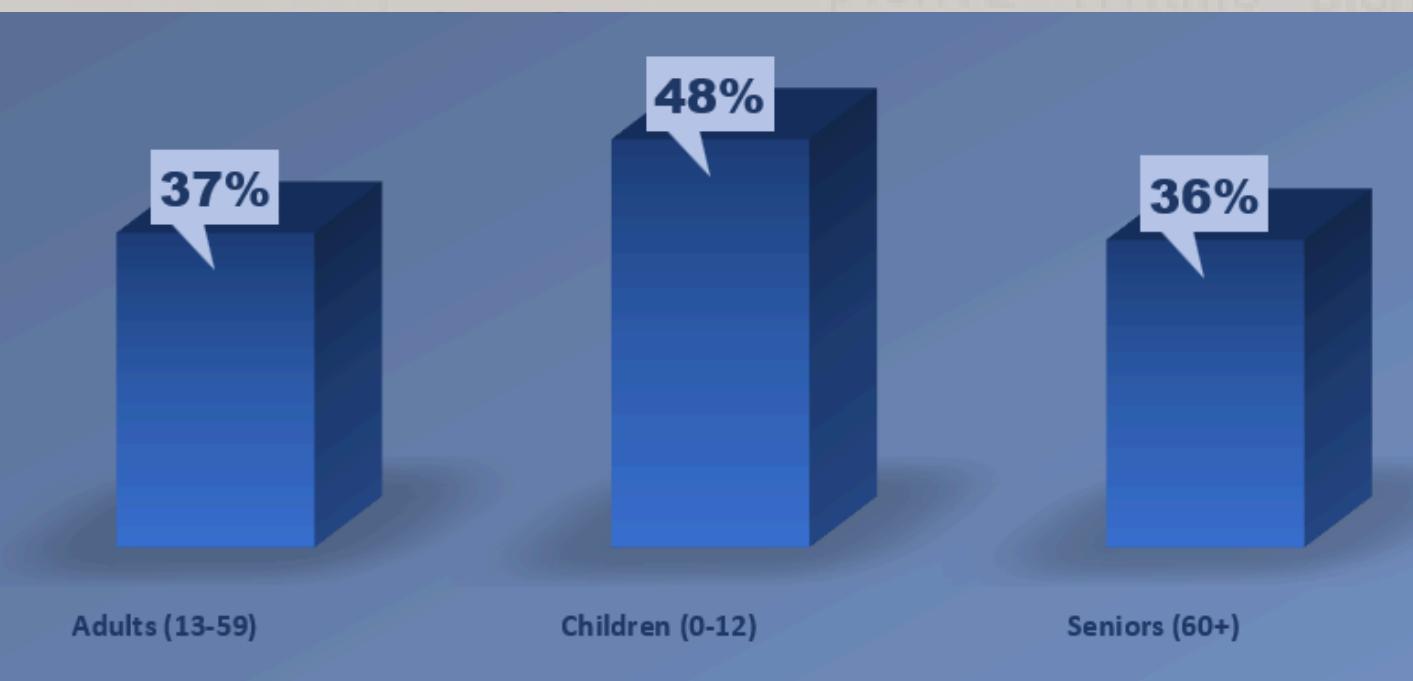
#### Visualization:

The bar chart comparing survival rates across different age groups highlights that children aged 0-12 had the highest survival rate.

#### Key Insight:

Children, due to the prioritization of families, were given more attention during the evacuation.

Age Group	Average of Survived
Adults (13-59)	37%
Children (0-12)	48%
Seniors (60+)	36%
<b>Grand Total</b>	<b>38%</b>



# 4. Did the size of a passenger's family influence their survival?

## Solution:

Smaller families (up to size 3) tended to have better survival rates compared to larger families. As the family size increases, the survival rate decreases significantly. Traveling alone resulted in a much lower chance of survival compared to travelling with a small family.

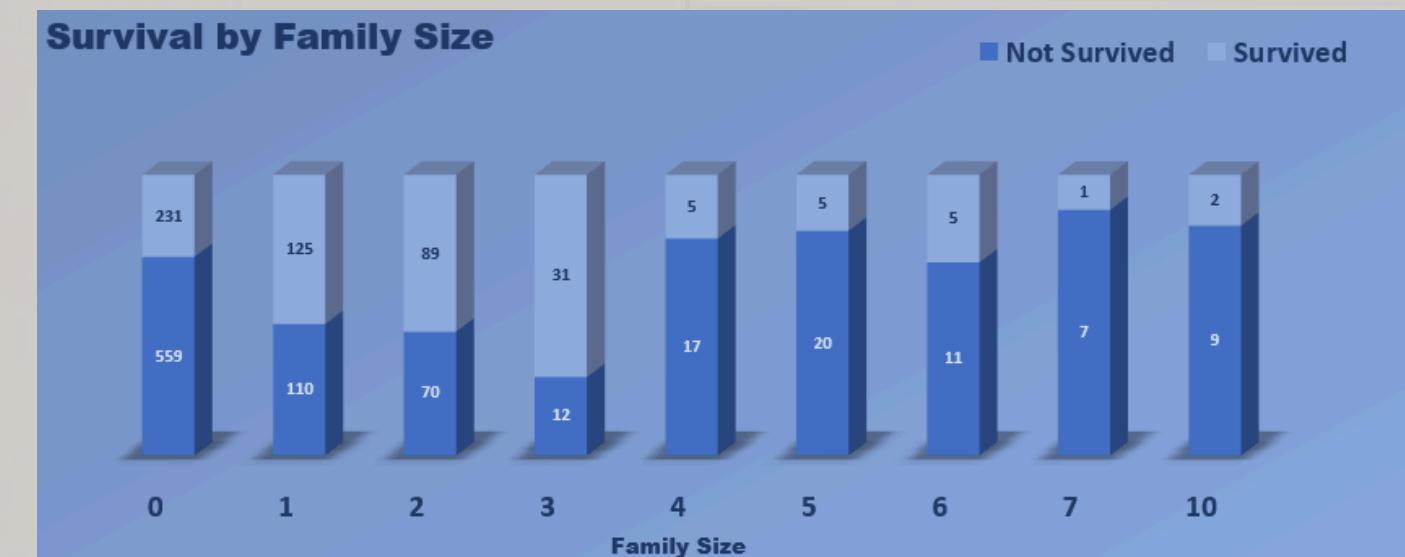
## Visualization:

The bar chart labelled "Survival by Family Size" presents a breakdown of passengers on the Titanic by their family size and survival status.

## Key Insight:

Family dynamics, both as support and as responsibility, played a role in survival outcomes.

Count of Passenger ID	Column Labels		
Total Family Members	Not Survived	Survived	Grand Total
0	559	231	790
1	110	125	235
2	70	89	159
3	12	31	43
4	17	5	22
5	20	5	25
6	11	5	16
7	7	1	8
10	9	2	11
Grand Total	815	494	1309



## 5. How did the port of embarkation (Cherbourg, Queenstown, Southampton) influence survival?

### Solution:

Analysis showed some variation in survival rates based on where passengers boarded.

### Visualization:

A bar chart shows that passengers who boarded at Cherbourg had a slightly higher survival rate compared to Southampton and Queenstown.

### Key Insight:

This difference may reflect a combination of demographic factors tied to each boarding port, such as wealth and social status.

Boarded	Not Survived	Survived	Grand Total
Cherbourg	137	135	272
Queenstown	69	54	123
Southampton	609	305	914
<b>Grand Total</b>	<b>815</b>	<b>494</b>	<b>1309</b>



# Measures & KPIs:

In this project, I employed several KPIs and measures to evaluate the data comprehensively:



*What was the total number of passengers onboard the Titanic?*

The total number of passengers onboard the Titanic can be calculated by counting all the unique Passenger IDs.

Formula : =COUNTA([Passenger ID])



# Measures & KPIs:

In this project, I employed several KPIs and measures to evaluate the data comprehensively:



*How many passengers survived the Titanic disaster?*

The total number of survivors can be calculated by counting the number of passengers who survived.

Formula : =CALCULATE(COUNTA(Sheet1[Passenger ID]), Sheet1[Survived] = 1)



# Measures & KPIs:

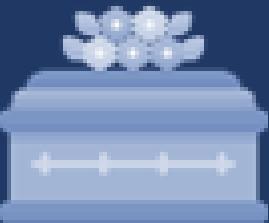
In this project, I employed several KPIs and measures to evaluate the data comprehensively:



*How many passengers died in the Titanic disaster?*

The total number of deaths can be calculated by counting the number of passengers with a "0" in the "Survived" column, which indicates they did not survive.

Formula : =CALCULATE(COUNTA(Sheet1[Passenger ID]), Sheet1[Survived] = 0)



**Non - Survivors**

**815**

# Measures & KPIs:

In this project, I employed several KPIs and measures to evaluate the data comprehensively:



*What was the average age of passengers onboard the Titanic?*

The average age of passengers can be found by calculating the mean of the "Age" column.

Formula : =AVERAGE(Sheet1[Age])



# Measures & KPIs:

In this project, I employed several KPIs and measures to evaluate the data comprehensively:



*What was the survival rate of passengers on the Titanic?*

The survival rate is the percentage of passengers who survived out of the total number onboard.

Formula : `=CALCULATE(COUNTA(Sheet1[Passenger ID]), Sheet1[Survived] = 0)`



# Dataset

PassengerId	Survived	Pclass	Name	Gender	Age	SibSp	Parch	Ticket	Fare	Cabin	Emba	Boarde
731	1	1	Allen	Miss. Elisabeth Walton	female	29	0	0	24160	211.3375	B5	S
306	1	1	Allison	Master. Hudson Trevor	male	0.92	1	2	113781	151.55	C22 C26	S
298	0	1	Allison	Miss. Helen Loraine	female	2	1	2	113781	151.55	C22 C26	S
1198	0	1	Allison	Mr. Hudson Joshua Creighton	male	30	1	2	113781	151.55	C22 C26	S
499	0	1	Allison	Mrs. Hudson J C (Bessie Waldo Daniels)	female	25	1	2	113781	151.55	C22 C26	S
461	1	1	Anderson	Mr. Harry	male	48	0	0	19952	26.55	E12	S
276	1	1	Andrews	Miss. Kornelia Theodosia	female	63	1	0	13502	77.9583	D7	S
807	0	1	Andrews	Mr. Thomas Jr	male	39	0	0	112050	0	A36	S
572	1	1	Appleton	Mrs. Edward Dale (Charlotte Lamson)	female	53	2	0	11769	51.4792	C101	S
494	0	1	Artagaveytia	Mr. Ramon	male	71	0	0	PC 17609	49.5042	C	
1094	0	1	Astor	Col. John Jacob	male	47	1	0	PC 17757	227.525	C62 C64	C
701	1	1	Astor	Mrs. John Jacob (Madeleine Talmadge Force)	female	18	1	0	PC 17757	227.525	C62 C64	C
370	1	1	Aubart	Mme. Leontine Pauline	female	24	0	0	PC 17477	69.3	B35	C
291	1	1	Barber	Miss. Ellen "Nellie"	female	26	0	0	19877	78.85	S	
631	1	1	Barkworth	Mr. Algernon Henry Wilson	male	80	0	0	27042	30	A23	S
169	0	1	Baumann	Mr. John D	male	70	0	0	PC 17318	25.925	S	
119	0	1	Baxter	Mr. Quigg Edmond	male	24	0	1	PC 17558	247.5208	B58 B60	C
300	1	1	Baxter	Mrs. James (Helene DeLaudeniere Chaput)	female	50	0	1	PC 17558	247.5208	B58 B60	C
219	1	1	Bazzani	Miss. Albina	female	32	0	0	11813	76.2917	D15	C
1010	0	1	Beattie	Mr. Thomson	male	36	0	0	13050	75.2417	C6	C A
249	1	1	Beckwith	Mr. Richard Leonard	male	37	1	1	11751	52.55542	D35	S
872	1	1	Beckwith	Mrs. Richard Leonard (Sallie Monypeny)	female	47	1	1	11751	52.55542	D25	S

PassengerId	Survived	Name	Sex	Age	Siblings/ Spouses	Parents/ Children	Ticket	Fare	Boarded	Survived Status
1	1	Allen, Miss. Elisabeth Walton	Female	29	0		0 24160	211.34	Southampton	Survived
2	1	Allison, Master. Hudson Trevor	Male	1	1		2 113781	151.55	Southampton	Survived
3	0	Allison, Miss. Helen Loraine	Female	2	1		2 113781	151.55	Southampton	Not Survived
4	0	Allison, Mr. Hudson Joshua Creighton	Male	30	1		2 113781	151.55	Southampton	Not Survived
5	0	Allison, Mrs. Hudson J C (Bessie Waldo Daniels)	Female	25	1		2 113781	151.55	Southampton	Not Survived
6	1	Anderson, Mr. Harry	Male	48	0		0 19952	26.55	Southampton	Survived
7	1	Andrews, Miss. Kornelia Theodosia	Female	63	1		0 13502	77.9583	Southampton	Survived
8	0	Andrews, Mr. Thomas Jr	Male	39	0		0 112050	0	Southampton	Not Survived
9	1	Appleton, Mrs. Edward Dale (Charlotte Lamson)	Female	53	2		0 11769	51.4792	Cherbourg	Not Survived
10	0	Artagaveytia, Mr. Ramon	Male	71	0		0 PC 17609	49.5	Cherbourg	Not Survived
11	0	Astor, Col. John Jacob	Male	47	1		0 PC 17757	227.525	Cherbourg	Not Survived
12	1	Astor, Mrs. John Jacob (Madeleine Talmadge Force)	Female	18	1		0 PC 17757	227.525	Cherbourg	Survived
13	1	Aubart, Mme. Leontine Pauline	Female	24	0		0 PC 17477	69.3	Cherbourg	Survived
14	1	Barber, Miss. Ellen "Nellie"	Female	26	0		0 19877	78.85	Southampton	Survived
15	1	Barkworth, Mr. Algernon Henry Wilson	Male	80	0		0 27042	30	Southampton	Survived
16	0	Baumann, Mr. John D	Male	70	0		0 PC 17318	25.925	Southampton	Not Survived
17	0	Baxter, Mr. Quigg Edmond	Male	24	0		1 PC 17558	247.5208	Cherbourg	Not Survived
18	1	Baxter, Mrs. James (Helene DeLaudeniere Chaput)	Female	50	0		1 PC 17558	247.5208	Cherbourg	Survived
19	1	Bazzani, Miss. Albina	Female	32	0		0 11813	76.2917	Cherbourg	Survived
20	0	Beattie, Mr. Thomson	Male	36	0		0 13050	75.2417	Cherbourg	Not Survived
21	1	Beckwith, Mr. Richard Leonard	Male	37	1		1 11751	52.55542	Southampton	Survived
22	1	Beckwith, Mrs. Richard Leonard (Sallie Monypeny)	Female	47	1		1 11751	52.55542	Southampton	Survived
23	1	Behr, Mr. Karl Howell	Male	26	0		0 111369	30	Cherbourg	Survived
24	1	Bidois, Miss. Rosalie	Female	42	0		0 PC 17757	227.525	Cherbourg	Survived

# Titanic Survival Analysis

## DASHBOARD



## REFLECTION

Analyzing the Titanic dataset through these variables gave me deeper insights into how socio-economic status, age, gender, and family dynamics played significant roles in survival during the disaster. It's clear that societal norms, such as the "women and children first" policy, were adhered to in the chaotic moments after the collision, heavily influencing survival patterns. The data also reveals that wealthier passengers had better access to lifeboats, reinforcing how class inequalities were deeply ingrained in the event's outcome.

Additionally, analyzing the role of family size uncovered an interesting pattern: those with smaller families or traveling alone had better survival odds, potentially due to the logistical challenges of evacuating larger families.

# Conclusion

The Titanic disaster, while a tragic historical event, offers valuable lessons in data analysis and human behavior. Through this project, I uncovered key factors influencing survival, such as gender, class, age, and family size. The analysis showed how societal structures—such as prioritizing women and children—impacted survival, while class disparities determined access to lifeboats.

Visualizing the data through graphs and charts helped in understanding these trends more clearly, revealing the story behind the numbers. This project not only sharpened my data analysis skills but also deepened my appreciation for the human stories that this data represents.

This analysis reminds us that behind every data point is a person, and by understanding data, we can better understand history and humanity.

ed in Each Other's Arms--Band Played  
"God, to Thee," as Ship Sank.

Playing "Nearer My God to Thee," Carrying 1589 Souls Back to Their  
of Ship's Company

150000!  
EXTRA BOSTON

LINER TITAN  
866 PASSE

NEW YORK, APRIL 16.—BETWEEN 1200 AND 1300  
PLUNGED WHEN THE "UNSEENABLE" TITANIC  
WENT TO THE BOTTOM OF THE SEA, SO IN  
TO THE TITANIC'S WIRELESS CALLS FOR  
LITTLE HOPE THAT THE DREAD REPORT  
OF THE 1,500 SOULS WHO WERE  
WERE SAVED.

THE STEAMER THE LARSEN, 1000 MILES AWAY  
COLLIDED WITH AN ICEBERG AT 11:45 P. M. LOCAL TIME  
IN THE MEDITERRANEAN SEA, AND 1000 MILES EAST OF  
THE TITANIC AT 11:45 P. M. LOCAL TIME.

THE TITANIC SANK SO SLOWLY THAT THE STEAMER COULD NOT  
REACH HER IN TIME.  
THREE OF THE SURVIVORS IN THE LIFEBOATS WERE BORN IN  
INDIA, ONE IN CHINA.  
THE SURVIVORS OF THE TITANIC IN THE LIFEBOATS WERE  
AND SEVERAL OF THE LOST WERE BORN IN INDIA.

SURVIVORS OF

# TITANIC

The Story of the Disaster in  
the Newspapers of the Day

# Thank You



\$19.99