

# Pediatric Allergies Unveiled: A Tableau Exploration of Prevalence and Demographics

The fascinating and data-driven study "Pediatric Allergies Unveiled: A Tableau Exploration of Prevalence and Demographics" explores the realm of pediatric allergies. This study aims to disentangle the intricate network of pediatric allergies by utilizing Tableau's excellent visualization capabilities. It does this by offering a thorough analysis of the prevalence, triggers, and demographic distribution of pediatric allergies.

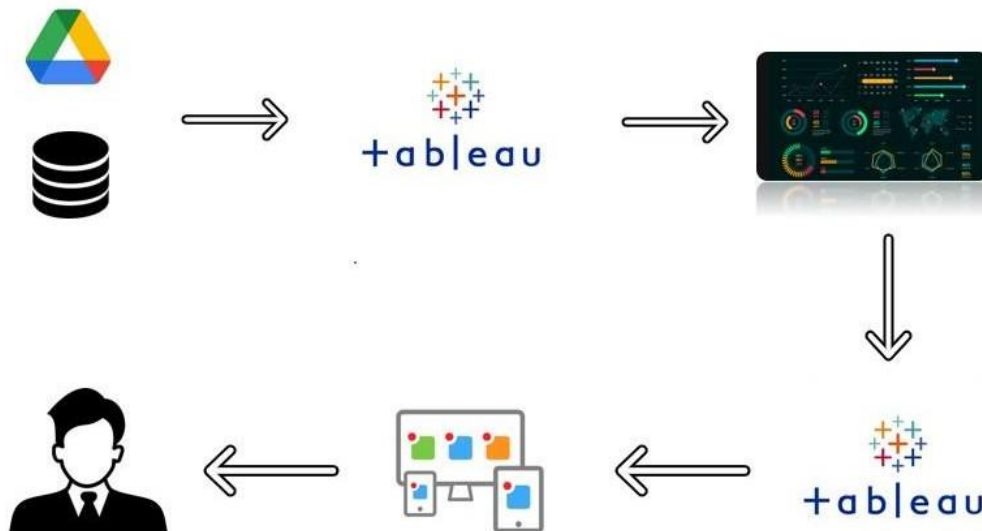
Worldwide, childhood allergies are a major health hazard that impact millions of children. This study intends to illuminate this problem by providing a gripping visual narrative, allowing medical professionals, parents, and politicians to fully comprehend its dynamics.



This investigation provides vital new information about the effects of allergies on kids from a range of age groups, socioeconomic backgrounds, and geographic locations through the painstaking study of data. By doing this, it gives interested parties the information they need to improve methods for diagnosis, treatment, and prevention.

In the end, this study's main goal is to open the door to a healthier future for our society's youngest citizens, one in which pediatric allergies are not only better understood but also better treated, enhancing everyone's quality of life and overall wellbeing.

### Technical Architecture:



### Project Flow

- Define Problem / Problem Understanding:
  - Specify the business problem related to pediatric allergies.
  - Clearly define business requirements for the project.
  - Conduct a literature survey to gather relevant information.
  - Assess the social or business impact of pediatric allergies to establish the significance of the project.
- Data Collection & Extraction from Database:
  - Collect a dataset containing information about pediatric allergies.
  - Store the data in a database for efficient management.
  - Perform SQL operations to clean and preprocess the data.
  - Establish a connection between the database and Tableau for data access.
- Data Preparation:
  - Prepare the data for visualization by handling missing values and ensuring data quality.
- Data Visualizations:
  - Create a variety of unique visualizations to represent different aspects of pediatric allergies, such as prevalence, triggers, and demographics.

- Dashboard:
  - Design a responsive and user-friendly dashboard in Tableau to present the visualizations.
- Story:
  - Build a narrative using a series of scenes in Tableau to tell a cohesive story about pediatric allergies, linking different aspects together.
- Performance Testing:
  - Assess the project's performance by evaluating:
    - The amount of data rendered to the database.
    - Utilization of data filters to enhance interactivity.
    - The number of calculation fields used.
    - The number of visualizations and graphs for efficiency.
- Web Integration:
  - Integrate the Tableau dashboard and story with a user interface (UI) using Flask or a similar web framework to make the project accessible online.
- Project Demonstration & Documentation:
  - Create an explanatory video that demonstrates the project's end-to-end solution, showcasing the dashboard, visualizations, and story.
  - Prepare comprehensive project documentation, providing a step-by-step guide to the project's development procedure, including data sources, analysis methods, and the technology stack used.

## **Milestone 1: Define Problem / Problem Understanding**

### **Activity 1: Specify the business problem**

The "Pediatric Allergies Unveiled" project takes on a critical healthcare business problem - the need for a holistic understanding of pediatric allergies' prevalence and demographic patterns. The rising incidence of pediatric allergies has significant implications for children's health and well-being, yet a dearth of detailed insights into their prevalence, regional variations, and demographic factors hampers the development of tailored interventions and informed healthcare strategies. Leveraging Tableau's data visualization capabilities, this project endeavors to unveil actionable insights. These insights will empower healthcare professionals, policymakers, and parents to make informed decisions concerning the prevention, management, and awareness of pediatric allergies. By bridging the information gap and facilitating data-driven decision-making, this project aims to provide effective solutions to this pressing business problem in healthcare.

### **Activity 2: Business requirements**

1. Comprehensive Data Collection:  
Acquire a diverse and comprehensive dataset of pediatric allergy cases from reputable sources, including medical databases, national health surveys, and scientific research studies. Ensure the dataset is representative of different geographic regions and demographics to provide a holistic view.
2. Data Cleaning and Preparation:  
Implement thorough data cleaning and preprocessing to rectify missing or erroneous entries, ensuring data accuracy and consistency. Structure the data to align with Tableau's requirements for effective analysis.
3. Prevalence Analysis:  
Develop informative visualizations that effectively convey the prevalence of various types of pediatric allergies over time. Highlight trends, fluctuations, and growth rates to provide a detailed understanding of allergy patterns.
4. Demographic Insights:  
Create visual representations that elucidate the relationships between pediatric allergies and demographic variables, including age, gender, ethnicity, and socioeconomic status. Identify vulnerable demographic groups and their prevalence rates.
5. Geospatial Mapping:  
Utilize geospatial visualizations to illustrate the regional distribution of pediatric allergies. Identify hotspots, regional disparities, and potential environmental factors that may contribute to allergy prevalence.

6. Interactive Dashboard:

Design an interactive Tableau dashboard that allows users to explore and interact with the data dynamically. Incorporate user-friendly filters and dynamic visual elements to facilitate personalized analysis and insights.

7. Risk Factor Identification:

Analyze potential risk factors associated with pediatric allergies, such as family history, environmental exposure, and dietary habits. Create visualizations to visually depict the influence of these factors on allergy prevalence.

8. Comparative Analysis:

Develop side-by-side comparisons of different allergy types, age groups, and demographics to facilitate data-driven decision-making. Identify areas that require targeted interventions or further investigation.

9. Accessibility and User-Friendly Design:

Ensure that all visualizations and the dashboard are intuitive, accessible, and easily comprehensible for both healthcare professionals and the general public. Prioritize user experience and usability in the design to enhance data accessibility.

### **Activity 3: Literature Survey**

A thorough analysis of the body of research on pediatric allergies is part of the "Pediatric Allergies Unveiled" project's literature review. This survey aims to comprehend the most recent trends, demographic patterns, risk factors, and allergy care techniques pertaining to children. It influences the research questions, methodology, and methods of data analysis used in the project. The survey addresses topics including demographics, risk factors, interventions, and data sources from prior research in addition to prevalence. In the end, the review of the literature establishes the basis for the project's understanding and guarantees its pertinence in relation to the body of knowledge already pertaining to allergies in children.

The literature review's goal is to:

Comprehending the Landscape:

It offers an all-encompassing perspective of the present condition of knowledge concerning pediatric allergies, encompassing the most recent research patterns and significant discoveries.

Finding Gaps:

The survey assists in locating areas or gaps in the research, which can direct the project's direction and enhance its originality.

#### Research Question Formulation:

The project's specific research questions are formulated with the assistance of the survey's insights.

#### Methodology and Framework:

By highlighting the techniques employed in earlier research, the survey provides guidance for the project's methodology, data collection, and analysis strategies.

#### Supporting Findings:

By situating the project's findings and conclusions within the framework of prior research, the survey provides support for its findings.

#### Management and Interventions:

Examine studies on successful therapies, management plans, and medical and lifestyle interventions for children with allergies.

#### Visualization and Data Presentation:

To inform the project's visualizations, review the literature on efficient data visualization methods, particularly in the context of healthcare and medical research.

### **Activity 4: Social or Business Impact.**

#### Making Informed Decisions:

To help parents, legislators, and medical professionals make wise choices about pediatric allergies, the project will offer insightful information.

#### Better Interventions:

Healthcare providers can create more effective interventions and strategies to prevent and manage pediatric allergies by having a better understanding of demographic trends and risk factors.

#### Public Awareness:

By educating the public about pediatric allergies, the project's aesthetically pleasing content can foster empathy and understanding.

#### Future Research:

The project's conclusions can act as a starting point for additional studies on pediatric allergies and associated medical problems.

## **Milestone 2: Data Collection & Extraction from Database**

Data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes and generate insights from the data.

### **Activity 1: Collect the dataset**

Please use the link to download the dataset: [Link](#)

#### **Activity 1.1: Understand the data**

Data contains all the meta information regarding the columns described in the CSV files. We have provided 1 CSV file:

1. food-allergy-analysis-Zenodo

#### **Column Description for food-allergy-analysis-Zenodo:**

1. BIRTH\_YEAR : Year of birth of the patient.
2. GENDER\_FACTOR : Gender of the patient.
3. RACE\_FACTOR : Race of the patient.
4. ETHNICITY\_FACTOR : Ethnicity of the patient.
5. PAYER\_FACTOR : Insurance coverage of the patient.
6. ATOPIC\_MARCH\_COHORT : Cohort of the patient.
7. AGE\_START\_YEARS : Age of the patient at the start of the study.
8. AGE\_END\_YEARS : Age of the patient at the end of the study.
9. SHELLFISH\_ALG\_START : Shellfish allergy status at the start of the study.
10. SHELLFISH\_ALG\_END : Shellfish allergy status at the end of the study.
11. MILK\_ALG\_START : Milk allergy status at the start of the study.
12. MILK\_ALG\_END : Milk allergy status at the end of the study.
13. SOY\_ALG\_START : Soy allergy status at the start of the study.
14. SOY\_ALG\_END : Soy allergy status at the end of the study.
15. EGG\_ALG\_START : Egg allergy status at the start of the study.

16.EGG\_ALG\_END : Egg allergy status at the end of the study.

17.WHEAT\_ALG\_START : Wheat allergy status at the start of the study.

18.WHEAT\_ALG\_END : Wheat allergy status at the end of the study.

19. PEANUT\_ALG\_START : Peanut allergy status at the start of the study.



20. PEANUT\_ALG\_END : Peanut allergy status at the end of the study.
21. SESAME\_ALG\_START : Sesame allergy status at the start of the study.
22. SESAME\_ALG\_END : Sesame allergy status at the end of the study.
23. TREENUT\_ALG\_START : Tree nut allergy status at the start of the study.
24. TREENUT\_ALG\_END : Tree nut allergy status at the end of the study.
25. WALNUT\_ALG\_START : Walnut allergy status at the start of the study.
26. WALNUT\_ALG\_END : Walnut allergy status at the end of the study.
27. PECAN\_ALG\_START : Pecan allergy status at the start of the study.
28. PECAN\_ALG\_END : Pecan allergy status at the end of the study.
29. PISTACH\_ALG\_START : Pistachio allergy status at the start of the study.
30. PISTACH\_ALG\_END : Pistachio allergy status at the end of the study.
31. ALMOND\_ALG\_START : Almond allergy status at the start of the study.
32. ALMOND\_ALG\_END : Almond allergy status at the end of the study.
33. BRAZIL\_ALG\_START : Brazil nut allergy status at the start of the study.
34. BRAZIL\_ALG\_END : Brazil nut allergy status at the end of the study.
35. HAZELNUT\_ALG\_START : Hazelnut allergy status at the start of the study.
36. HAZELNUT\_ALG\_END : Hazel
37. ATOPIC\_DERM\_START : Atopic dermatitis status at the start of the study.
38. ATOPIC\_DERM\_END : Atopic dermatitis status at the end of the study.
39. ALLERGIC\_RHINITIS\_START : Allergic rhinitis status at the start of the study.
40. ALLERGIC\_RHINITIS\_END : Allergic rhinitis status at the end of the study.
41. ASTHMA\_START : Asthma status at the start of the study.
42. ASTHMA\_END : Asthma status at the end of the study.
43. FIRST\_ASTHMARX : First asthma medication

prescribed.44.LAST\_ASTHMARX : Last asthma

medication prescribed.

45.NUM\_ASTHMARX: Number of asthma medications prescribed.

## Activity 2: Storing Data in DB & Perform SQL Operations:

```
use pediatric_allergies_unveiled;
ALTER TABLE foodallergyanalysiszenodo
ADD COLUMN date_of_birth DATE;

UPDATE foodallergyanalysiszenodo
SET date_of_birth = STR_TO_DATE(birth_year, '%Y');
```

## Activity 3: Connect DB with Tableau

The screenshot shows the Tableau interface. On the left, the 'Connections' pane lists 'localhost MySQL'. The 'Database' dropdown is set to 'pediatric\_allergies\_unveiled'. The 'Table' dropdown is set to 'food-allergy-analysis-zenodo'. The main view shows a data table with 50 fields and 189068 rows. The table has columns: Subject Id, Birth Year, Gender Factor, Race Factor, Ethnicity Factor, and Pay. The 'Fields' pane on the left shows the table structure with columns: Type, Field Name, Physical Table, and Rem....

Subject Id	Birth Year	Gender Factor	Race Factor	Ethnicity Factor	Pay
1	2006	S1 - Female	R1 - Black	E0 - Non-Hispanic	P1
2	1994	S1 - Female	R0 - White	E0 - Non-Hispanic	P0
3	2006	S0 - Male	R0 - White	E1 - Hispanic	P0
4	2004	S0 - Male	R4 - Unknown	E1 - Hispanic	P0
5	2006	S1 - Female	R1 - Black	E0 - Non-Hispanic	P0
6	2006	S0 - Male	R0 - White	E0 - Non-Hispanic	P1

## Milestone 3: Data Preparation

### Activity 1: Prepare the Data for Visualization

Preparing the data for visualization involves cleaning the data to remove irrelevant or missing data, transforming the data into a format that can be easily visualized, exploring the data to identify patterns and trends, filtering the data to focus on specific subsets of data, preparing the data for visualization software, and ensuring the data is accurate and complete. This process helps to make the data easily understandable and ready for creating visualizations to gain insights into the performance and efficiency.

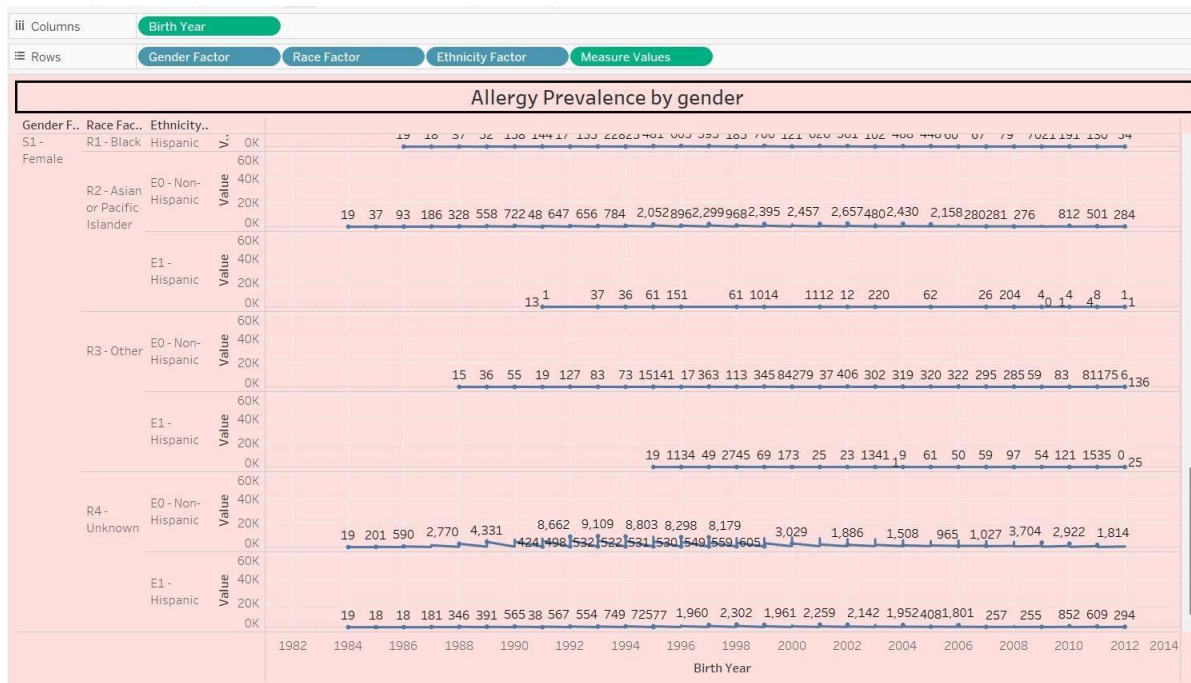
## Milestone 4: Data Visualization

Data visualization is the process of creating graphical representations of data in order to help people understand and explore the information. The goal of data visualization is to make complex data sets more accessible, intuitive, and easier to interpret. By using visual elements such as charts, graphs, and maps, data visualizations can help people quickly identify patterns, trends, and outliers in the data.

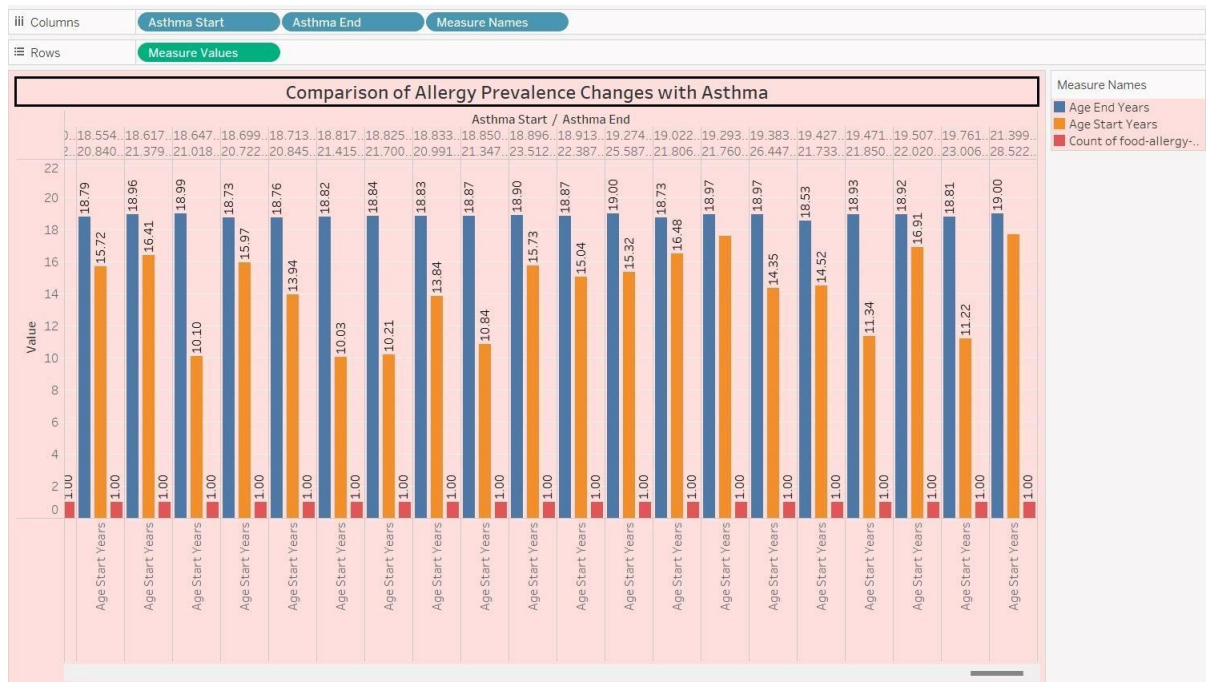
### Activity 1: No of Unique Visualizations

The number of unique visualizations that can be created with a given dataset. Some common types of visualizations that can be used to analyze the performance. This project aims to uncover actionable insights that can assist healthcare professionals, policymakers, and parents in making informed choices regarding the prevention, management, and awareness of pediatric allergies. By bridging the gap between data and decision-making, the project seeks to address this business problem with impactful solutions.

### Activity 1.1: Allergy Prevalence Deltas Visualization by Gender



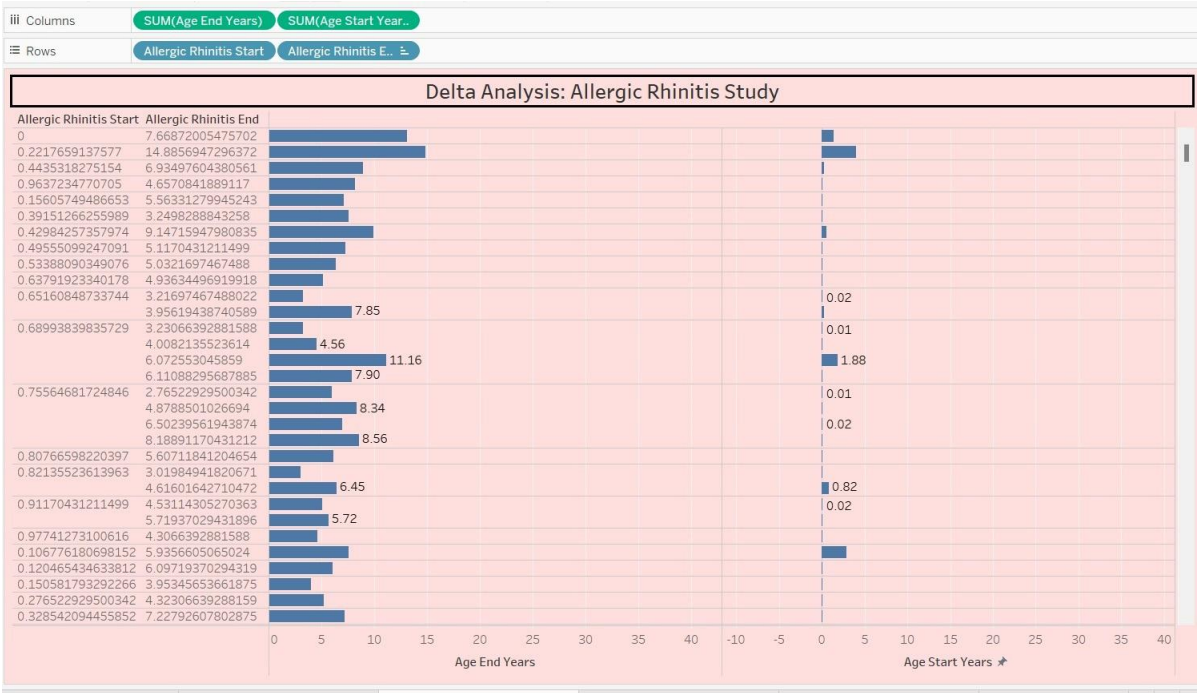
### Activity 1.2: Comparison of Allergy Prevalence Changes with Asthma



### Activity 1.3: Delta Analysis: Number of Asthma Medications Prescribed



Activity 1.4: Delta Analysis: Allergic Rhinitis Study



Activity 1.5: Delta Analysis: Atopic Derm Study





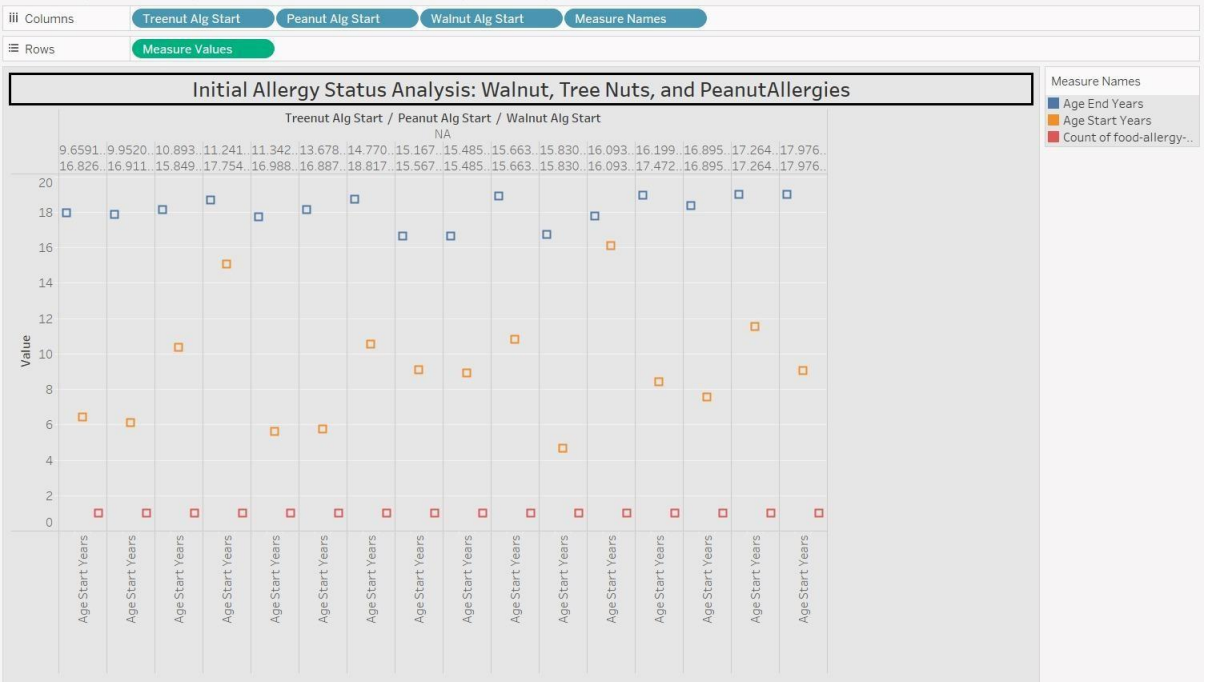
## Activity 1.6: Allergy Analysis: Milk And Wheat Sensitivity Patterns



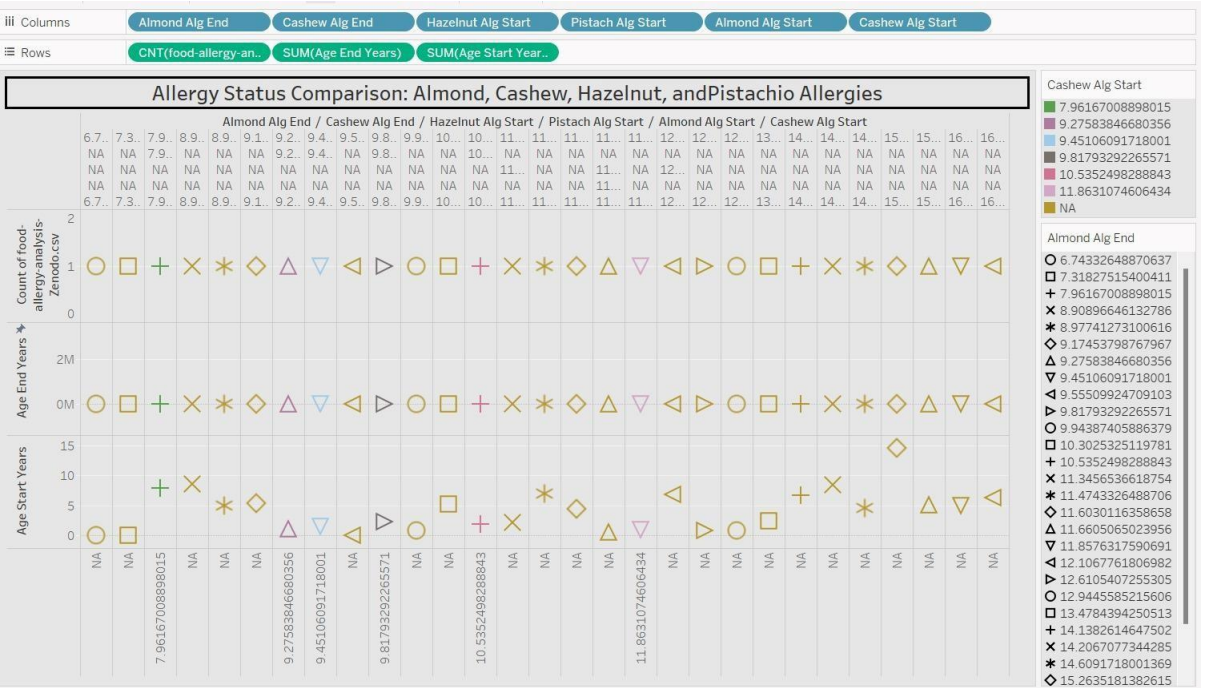
## Activity 1.7: Comparative Study of Allergic Reactions to Egg, Fish, and Shellfish



Activity 1.8: Initial Allergy Status Analysis: Walnut, Tree Nuts, and Peanut



Activity 1.9: Allergy Status Comparison: Almond, Cashew, Hazelnut





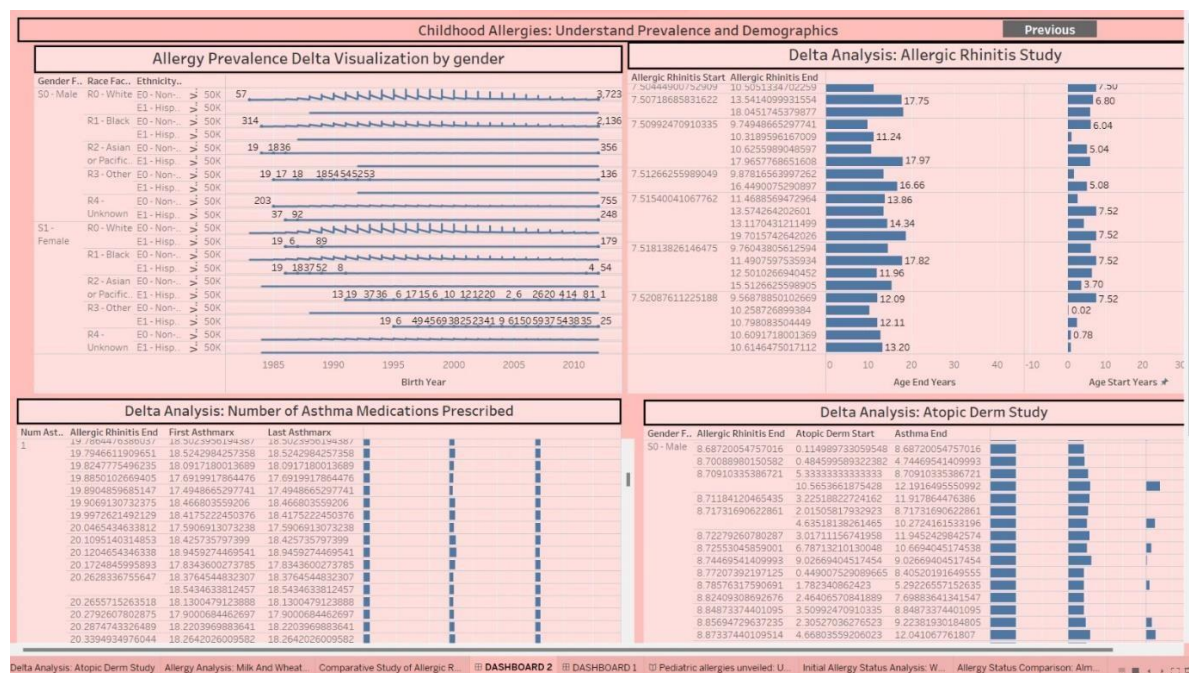
## Milestone 5: DASHBOARD:

A dashboard is a type of graphical user interface (GUI) that presents facts and information in a logical, readable manner. Dashboards are usually made for a particular use case or purpose and are frequently used to enable real-time data monitoring and analysis. Dashboards have application in diverse domains, including business, finance, manufacturing, healthcare, and numerous other sectors. They can be used to monitor performance metrics, track key performance indicators (KPIs), and present data as tables, graphs, and charts.

### Activity :1- Responsive and Design of Dashboard

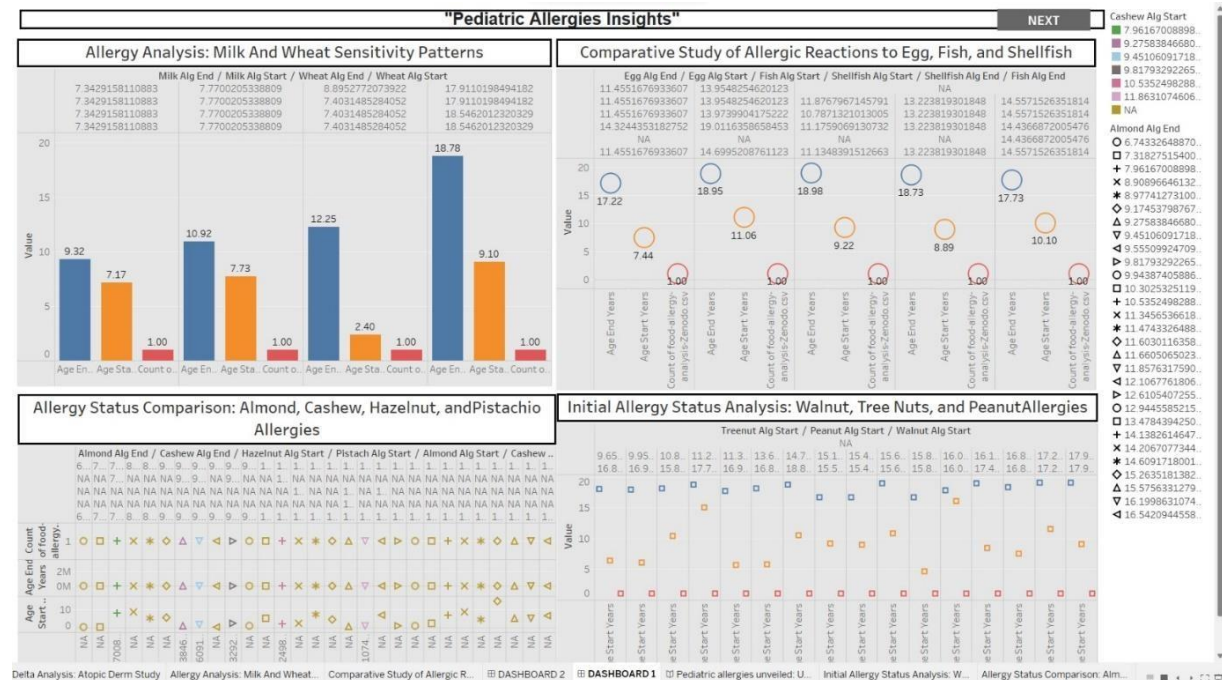
The responsiveness and structure of the dashboard are crucial for assessing the Pediatric Allergies Unveiled in order to guarantee that the data is understandable and helpful. When developing a responsive and effective dashboard, it's crucial to consider elements like interactivity, accessibility, customizability, security, and a user-centered design. A data-driven approach is also recommended. The goal is to create a data-driven, interactive dashboard that is easy to use and provides actionable insights to improve the efficiency and efficacy of Pediatric Allergies Unveiled.

### DASHBOARD-1:



## Milestone 6:

### DASHBOARD-2:



## Story

A data tale is a type of narrative framework that is intended to increase the readability and engagement of information by showcasing data and analysis. A typical data tale is composed of three sections: an introduction that provides a clear and simple explanation of the data's background and context; a body that presents the data and analysis in a logical and systematic manner; and a conclusion that summarizes the key findings and their implications. Data stories can be communicated using a variety of media, such as films, interactive visualizations, reports, and presentations.

### Activity:1- No of Scenes of Story

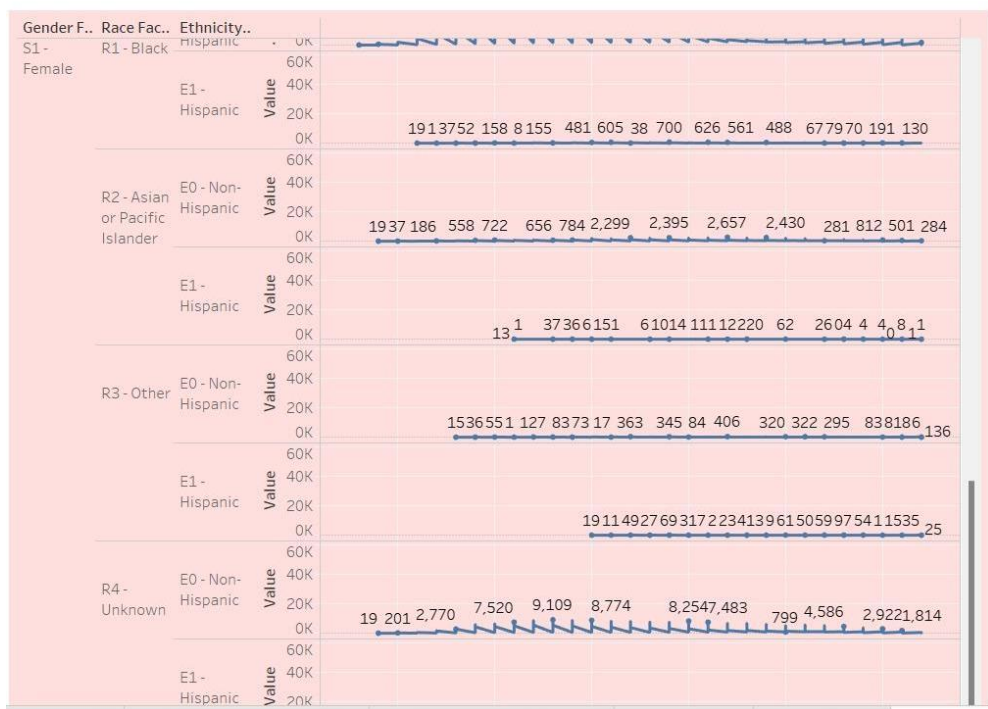
The complexity of the study and the particular insights that are intended to be communicated will determine how many scenes are included in a storyboard for a data visualization analysis of the Pediatric Allergies Unveiled. A storyboard is a diagram that illustrates the data analysis procedure by segmenting the study into discrete phases or scenes.

Milestone 7:

Pediatric Allergies Unveiled: Understand Prevalence and Demographics Story

Explore the gender-specific variations in allergy prevalence Analyze key allergens, understand deltas, and uncover Insights for Improved healthcare

Delve into the relationship between allergy prevalence and asthma incidence Discover how changes in allergy prevalence correlate with asthma cases, shading light



Pediatric Allergies Unveiled: Understand Prevalence and Demographics Story

allergy prevalence and asthma incidence correlate with asthma cases, shading light

Exploring the dynamics of Rhinitis prevalence through a delta analysis. Investigate how this common allergy evolved over the time, pinpointing key trends and

Delve into the relationship between allergy prevalence and asthma incidence Discover how changes in allergy prevalence correlate with asthma cases, shading light





Milestone 8:

Pediatric Allergies Unveiled: Understand Prevalence and Demographics Story

ergy prevalence and asthma incidence  
irrelate with asthma cases, shading light

Exploring the dyamics of Rhintis prevalence through a delta analysis. Investigate  
how this common allergy evolved over the time, pinpointing key trends and

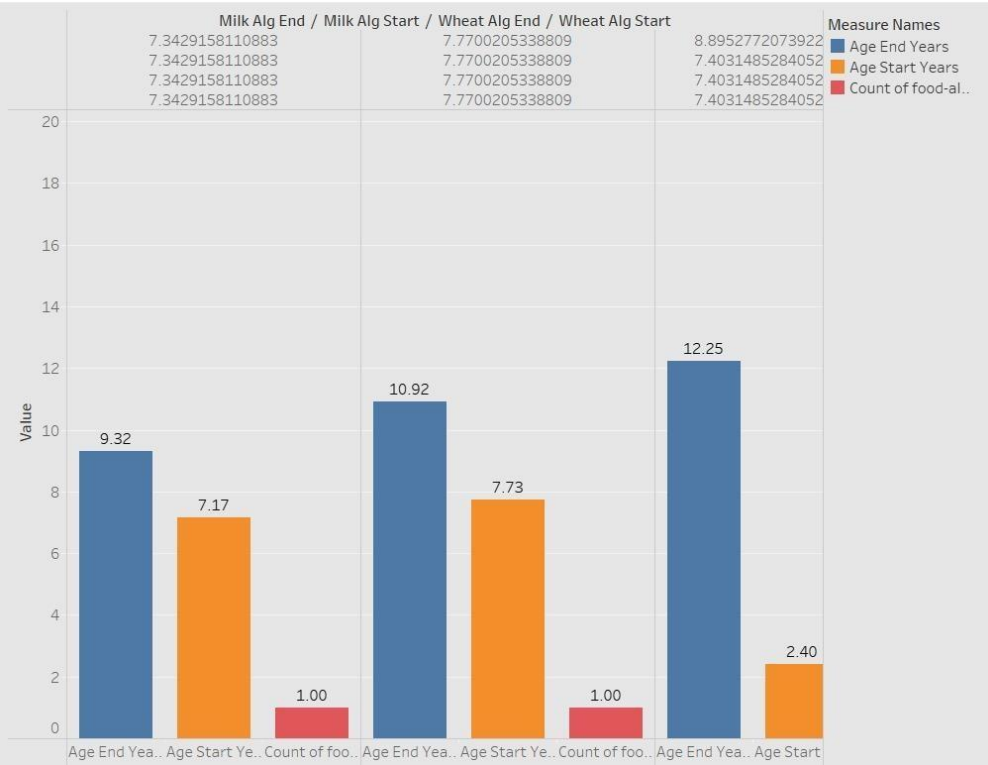
Delve  
preva



ence through a delta analysis. Investigate  
the time, pinpointing key trends and

Delve into the world of milk and wheat sensivity patterns. Analyze  
prevalence, demographics and regional variations to gain insights into how these

Explo  
allerg



## Milestone 9:

< wheat sensitivity patterns. Analyze regional variations to gain insights into how these  
Exploring the allergies caused by Eggs, Fish and Shellfish. Discovering the allergen factors of this daily used products and Seafood. Analyzing the >

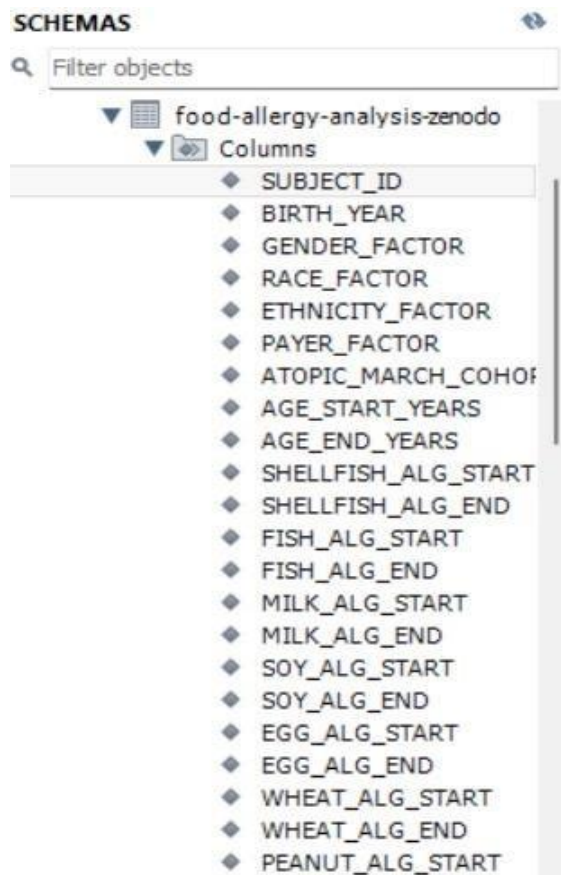
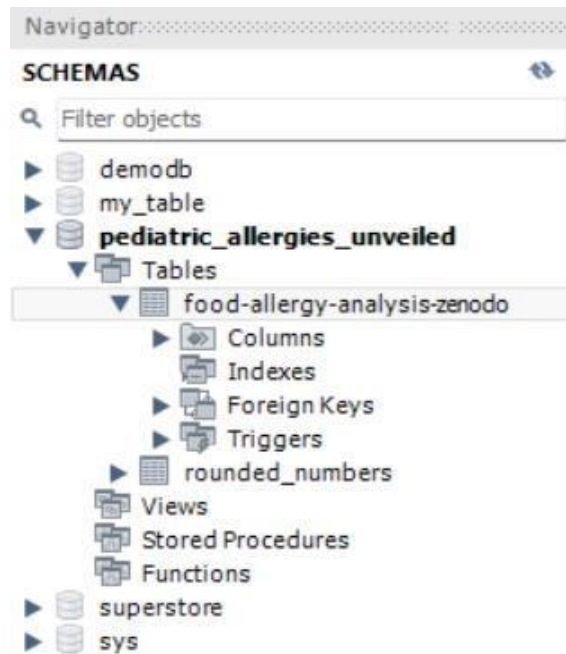


## PERFORMANCE TESTING

### Activity 1: Amount of Data Rendered to DB

- The amount of data that is rendered to a database depends on the size of the dataset and the capacity of the database to store and retrieve data.
- Open the MySQL Workbench, go to the database then click to expand the tables, select the table and click on (i) button to get the information related to table such as column count, table rows etc.


## Milestone 10:








### Activity 3: No of Calculation Fields

DataAnalytics

 Pediatric Allergies

**Tables**

Abc Atopic Derm End

Abc Atopic Derm Start

TJF Atopic March Cohort

# Birth Year

Abc Brazil Alg End

Abc Brazil Alg Start

Abc Cashew Alg End

Abc Cashew Alg Start

Abc Egg Alg End

Abc Egg Alg Start

Abc Ethnicity Factor

Abc First Asthmarx

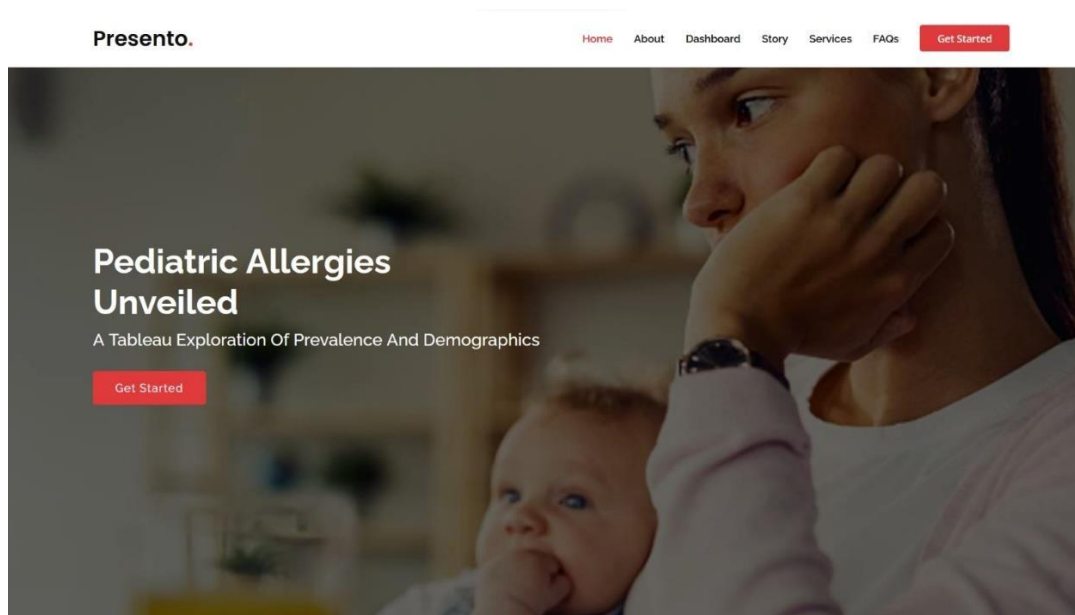
Abc Fish Alg End

Abc Fish Alg Start

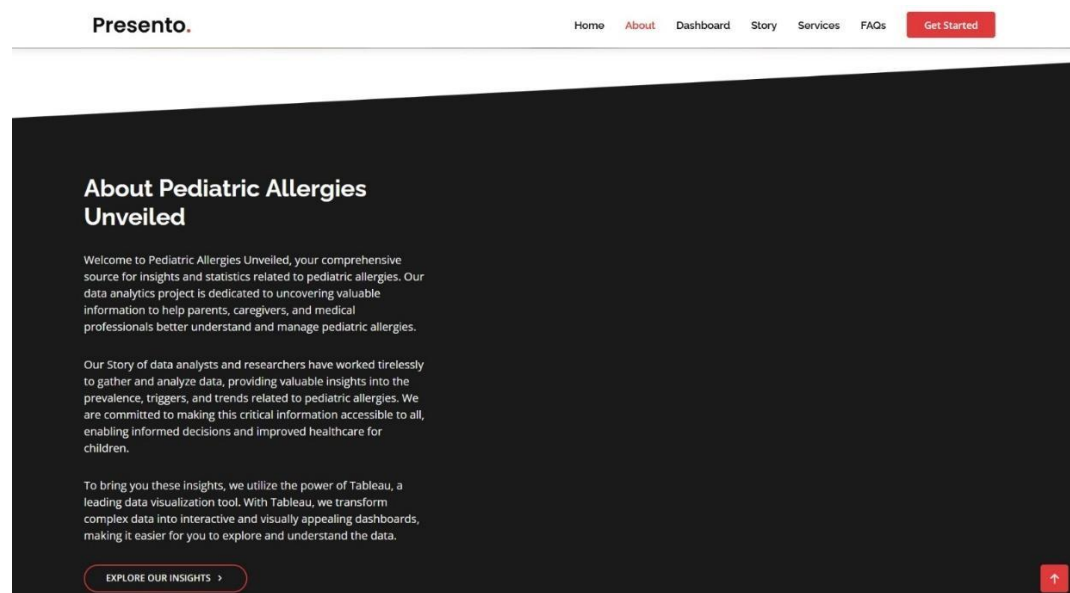


## Milestone 8: Web integration

### HOME SECTION:



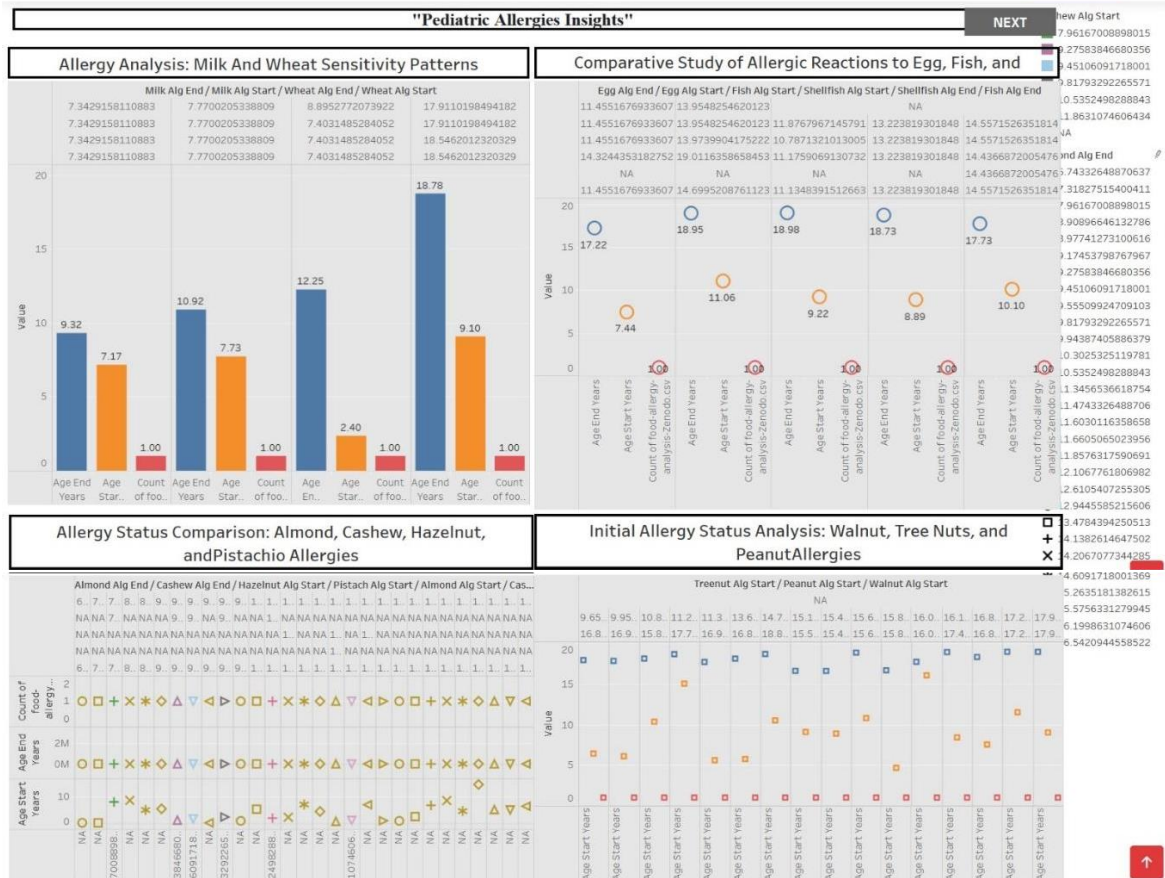
### ABOUT SECTION:



### DASHBOARD SECTION:

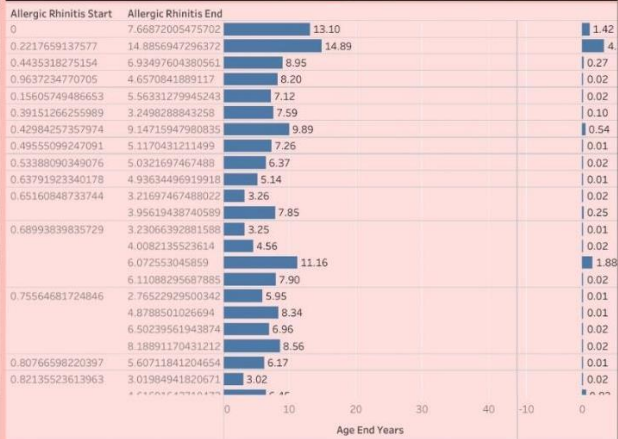
Presento.

Home About **Dashboard** Story Services FAQs **Get Started**

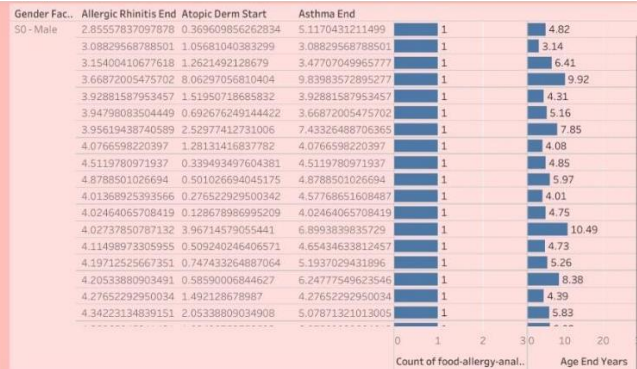


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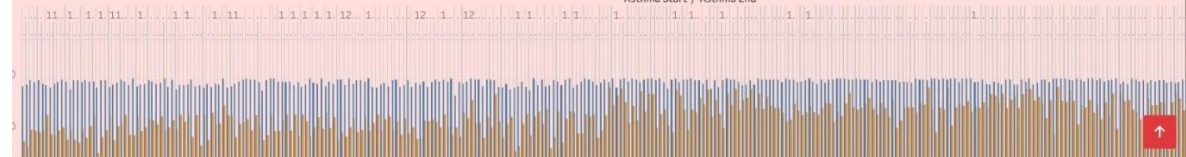
### Delta Analysis: Allergic Rhinitis Study



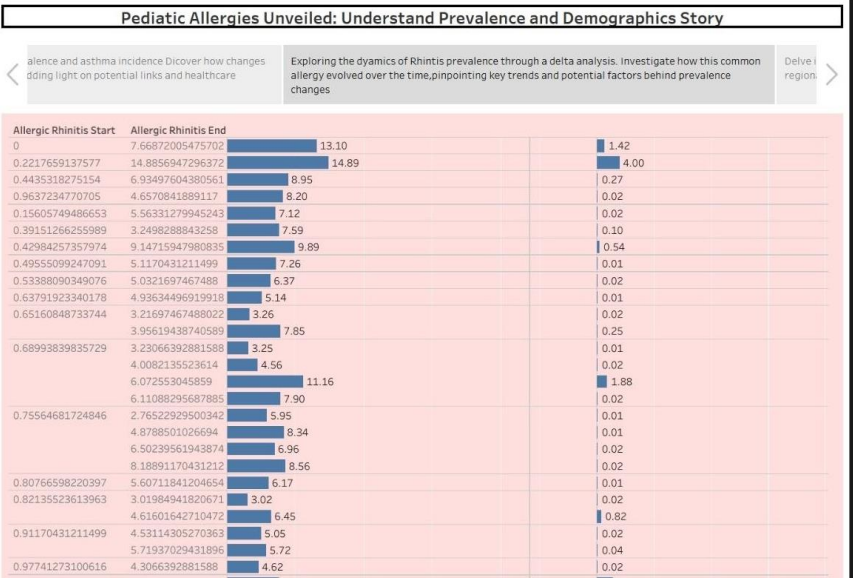
## Delta Analysis: Atopic Derm Study



## Asthma Start / Asthma End



STORY SECTION:



SERVICE’S SECTION:

### PEDIATRIC ALLERGIES MEASURES

Our Approach to Pediatric Allergies

#### Measure 1

Preventive Measures

- Identify allergen triggers in the environment.
- Implement allergen avoidance strategies.
- Use hypoallergenic bedding and covers.

Medication:

For severe allergies, prescription antihistamines or epinephrine may be prescribed by a pediatrician.

#### Measure 2

Education & Management

- Educate parents and caregivers about allergy management.
- Develop a personalized allergy action plan.
- Monitor allergy symptoms and triggers.

Medication:

Provide allergy medication as prescribed by a pediatric allergist or healthcare provider.

#### Measure 3

Healthy Lifestyle

- Promote a healthy diet to boost the immune system.
- Encourage regular physical activity.
- Stress management techniques for caregivers.

Medication:

Consult with a pediatrician for medication recommendations based on the child's health.

#### Measure 4

Allergen Control

- Regularly clean and maintain the child's living environment.
- Ensure proper ventilation and air quality.
- Consider allergen-proof covers for bedding.

Medication:

Medication may be prescribed to manage specific allergy symptoms. Consult with a healthcare provider.

FAQ'S SECTION:

Presento.

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FREQUENTLY ASKED QUESTIONS

What are pediatric allergies?

How can I identify pediatric allergies?

What treatments are available for pediatric allergies?

Treatment options for pediatric allergies may include antihistamines, allergy shots, and allergen avoidance strategies. Consult a healthcare provider for personalized recommendations.

Are pediatric allergies life-threatening?

Can pediatric allergies be managed with lifestyle changes?

Thank You

EXECUTION VIDEO(USING FLASK):

[https://drive.google.com/file/d/1A-RymbPAzLvmnnukT\\_ARTuPUMrDT8Vmj/view?usp=sharing](https://drive.google.com/file/d/1A-RymbPAzLvmnnukT_ARTuPUMrDT8Vmj/view?usp=sharing)

---THANK YOU--

