

## SAS Viya Dynamic Visualization of Data

Jumin Geng, Teva Pharmaceutical Industries, Ltd

### ABSTRACT

SAS Viya enables powerful, interactive, and scalable data visualization capabilities that enhance analytical decision-making. The dynamic visualization methods allow for more effective display of high dimensional data which can improve the interpretation of various dimensions of clinical trial data. This paper demonstrates several dynamic visualization techniques including crosstab visualizations with in-cell bar charts, butterfly charts, and panel charts. These techniques help users quickly identify patterns, compare metrics, and communicate insights for clinical trial data effectively.

### INTRODUCTION

In today's data-driven environment, the ability to visualize data dynamically is essential for effective analysis and decision-making. SAS Viya provides a modern analytics platform that supports interactive dashboards and advanced visualization techniques. This paper explores several visualization approaches demonstrated through SAS Viya, focusing on how they improve clarity, usability, and insight generation.

### METHODS

SAS Viya was used to prepare and visualize data within a unified SAS environment. Because all processing occurs on the platform, analysis datasets do not need to be transferred between systems, and the same CAS dataset can be accessed concurrently by multiple users. A key advantage of SAS Viya is its web-based reporting and dashboard functionality, which enables users to generate visualizations through intuitive point-and-click interfaces without requiring SAS programming. Charts can be created by navigating through Objects → Options → Data Roles → Display Rules → Filters.

## RESULTS

### CROSTAB WITH BAR CHART IN CELL VISUALIZATION

Table 1 summarizes the count and percentages of adverse events data. By embedding bar charts within cells, users can quickly compare without leaving the table structure. This approach enhances readability and allows analysts to identify trends and outliers more efficiently.

Adverse Events During the Double-Blind Treatment Period by System Organ Class, Preferred Term - Safety Analysis Set





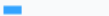
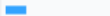


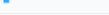
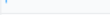
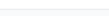
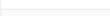
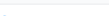
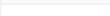
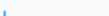
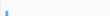


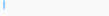
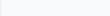
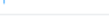
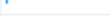
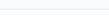
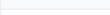
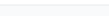
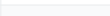
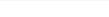
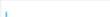
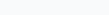
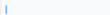


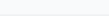
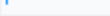
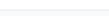
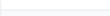
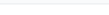
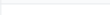
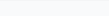
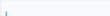








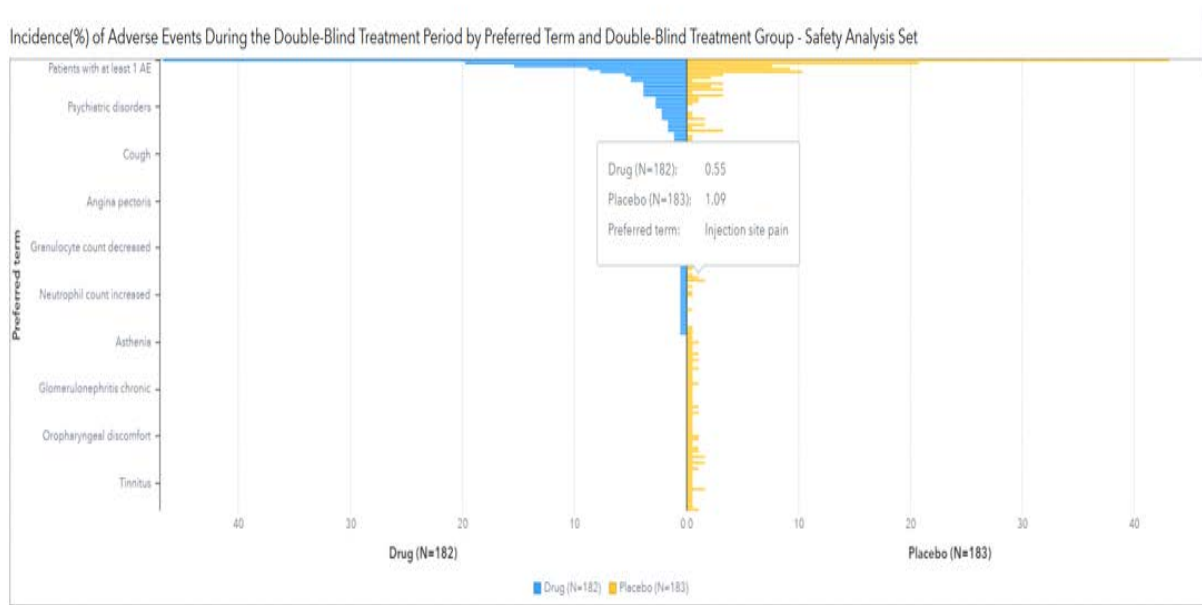
|                                   | Drug (N=182)  |       | Placebo (N=183)  |       |
|-----------------------------------|---|-------|--|-------|
|                                   | %   | n     | %  | n     |
| Patients with at least 1 AE       | 46.7  | 85    | 43.17  | 79    |
| Patients with at least 1 AE       |    | 46.7  |    | 43.17 |
| Infections and infestations       | 43.42   | 79    | 45.94  | 84    |
| Infections and infestations       |    | 43.42 |    | 45.94 |
| Upper respiratory tract infection | 8.79  | 16    | 9.29   | 17    |
| Upper respiratory tract infection |    | 8.79  |    | 9.29  |
| COVID-19                          | 3.85  | 7     | 3.28   | 6     |
| COVID-19                          |    | 3.85  |    | 3.28  |
| Nasopharyngitis                   | 2.75  | 5     | 0.55   | 1     |
| Nasopharyngitis                   |    | 2.75  |    | 0.55  |
| Urinary tract infection           | 2.2   | 4     | 1.64   | 3     |
| Urinary tract infection           |    | 2.2   |    | 1.64  |
| Conjunctivitis                    | 1.1   | 2     | —  | —     |
| Conjunctivitis                    |    | 1.1   |    | 0     |
| COVID-19 pneumonia                | 1.1   | 2     | —  | —     |
| COVID-19 pneumonia                |    | 1.1   |    | 0     |
| Pharyngitis                       | 1.1   | 2     | 1.1  | 2     |
| Pharyngitis                       |    | 1.1   |    | 1.1   |
| Tonsillitis                       | 1.1   | 2     | —  | —     |
| Tonsillitis                       |    | 1.1   |    | 0     |
| Appendicitis                      | 0.55  | 1     | —  | —     |
| Appendicitis                      |    | 0.55  |    | 0     |
| Influenza                         | 0.55  | 1     | 1.1  | 2     |
| Influenza                         |    | 0.55  |    | 1.1   |
| Periodontitis                     | 0.55  | 1     | —  | —     |
| Periodontitis                     |    | 0.55  |    | 0     |
| Bronchitis                        | —   | —     | 0.55   | 1     |
| Bronchitis                        |  | 0     |  | 0.55  |
| Gastroenteritis                   | —   | —     | 1.09   | 2     |
| Gastroenteritis                   |  | 0     |  | 1.09  |
| Herpes zoster                     | —   | —     | 0.55   | 1     |
| Herpes zoster                     |  | 0     |  | 0.55  |
| Myringitis                        | —   | —     | 0.55   | 1     |
| Myringitis                        |  | 0     |  | 0.55  |
| Oral herpes                       | —   | —     | 0.55   | 1     |
| Oral herpes                       |  | 0     |  | 0.55  |
| Otitis media                      | —   | —     | 1.09   | 2     |
| Otitis media                      |  | 0     |  | 1.09  |
| Pneumonia                         | —   | —     | 1.64   | 3     |
| Pneumonia                         |  | 0     |  | 1.64  |
| Respiratory tract infection       | —   | —     | 0.55   | 1     |
| Respiratory tract infection       |  | 0     |  | 0.55  |
| Rhinitis                          | —   | —     | 0.55   | 1     |
| Rhinitis                          |  | 0     |  | 0.55  |
| Sinusitis                         | —   | —     | 0.55   | 1     |
| Sinusitis                         |  | 0     |  | 0.55  |
| Tracheitis                        | —   | —     | 0.55   | 1     |
| Tracheitis                        |  | 0     |  | 0.55  |

Table 1 Adverse Events by Treatment Groups

## BUTTERFLY CHART

Figure 1 Butterfly chart presents 2 treatment groups side by side along a shared central axis, making them particularly effective for comparative analyses. It can be used to compare the incidence of adverse event across drug and Placebo treatment groups.

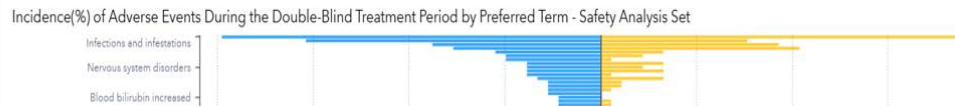
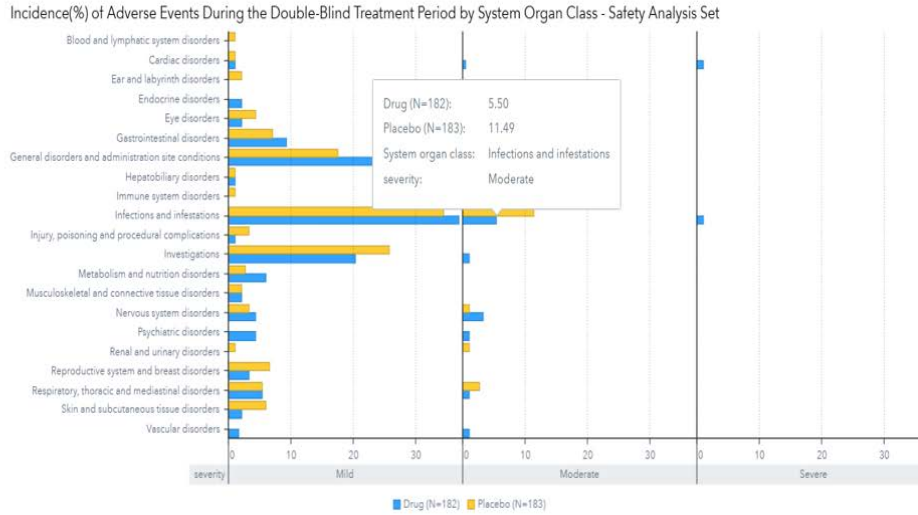
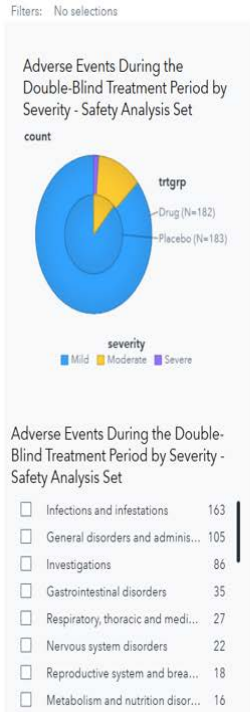


| Preferred term                                       | Drug (N=182) | Placebo (N=183) |
|--|--------------|-----------------|
| Patients with at least 1 AE                          | 46.70        | 43.17           |
| Infections and infestations                          | 19.78        | 20.76           |
| General disorders and administration site conditions | 15.39        | 7.65            |
| Upper respiratory tract infection                    | 8.79         | 9.29            |

Figure 1. Butterfly Chart Display of Adverse Events by Treatment Groups

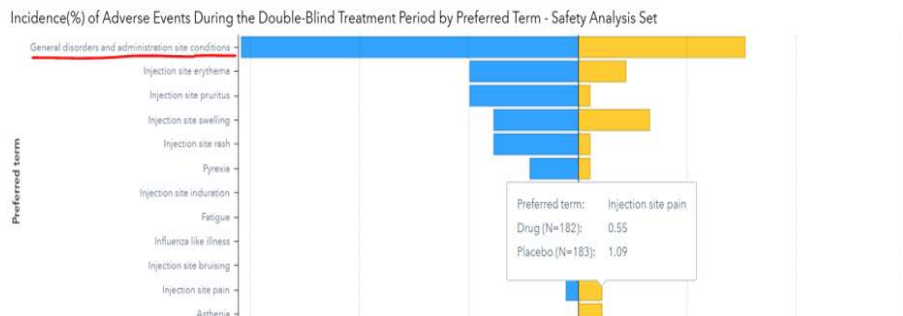
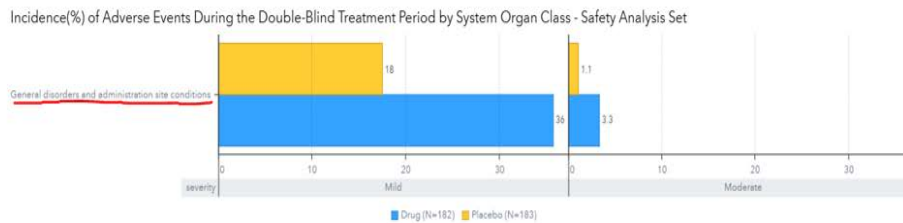
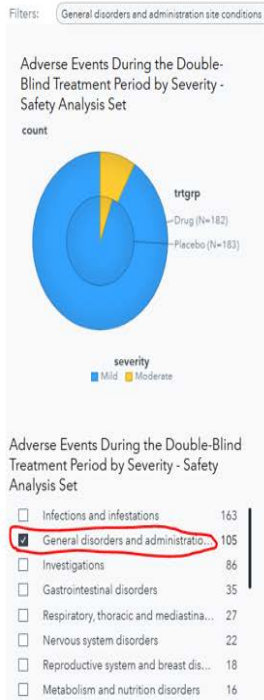
## PANEL CHARTS FOR MULTI-DIMENSIONAL ANALYSIS

Panel charts display multiple similar charts across categories, enabling comparison across treatment groups. This technique is particularly useful when analyzing trends across groups. Figure 2 Display the count and percentages of Adverse Events by Treatment Groups for all System Organ Class(SOC), Preferred Term(PT).



**Figure 2. Panel Chart Display of Adverse Events by Treatment Groups**

SAS Viya supports panel charts with flexible layouts and interactive controls, making it easier to explore large datasets without overwhelming the viewer. For example, Figure 2 displays the counts and percentages only 1 SOC (System Organ Class) *General Disorders and Administration Site Conditions*.



**Figure 3. Panel Chart Display of Adverse Events by Selecting Only 1 SOC by Treatment Groups**

## CONCLUSION

Dynamic data visualization in SAS Viya significantly enhances analytical capabilities by making complex clinical trial data more accessible and interpretable. Techniques such as crosstab visualizations with embedded charts, butterfly charts, and panel charts provide powerful tools for comparison and insight generation. By following best practices, Clinical trial team can leverage these tools to improve decision-making and communication.

## ACKNOWLEDGMENTS

The author wants to thank Teva Group Director Krishna Chotneeru for his comments and suggestions.

## RECOMMENDED READING

- *SAS® Visual Analytics 1 for SAS® Viya®: Basics Slides and Notes*

## CONTACT INFORMATION <HEADING 1>

Your comments and questions are valued and encouraged. Contact the author at:

Jumin Geng  
Teva Pharmaceutical Industries, Ltd  
Email: [Jumin.geng@tevapharm.com](mailto:Jumin.geng@tevapharm.com)