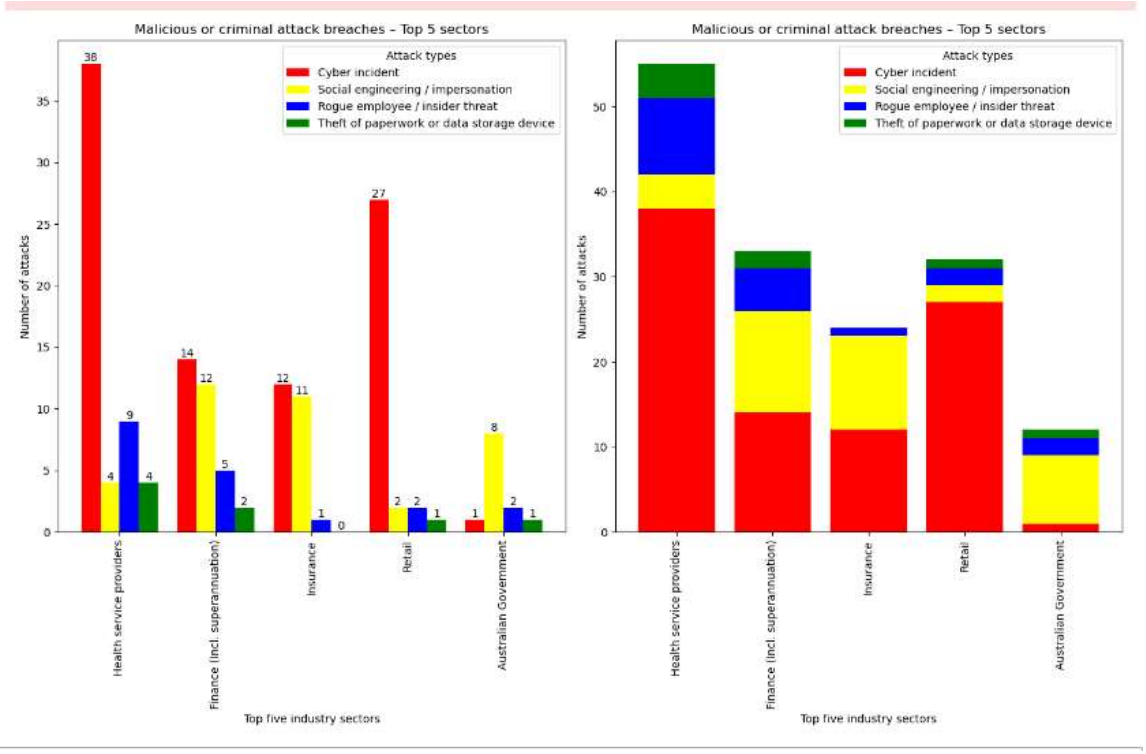
Task 4.2C

Visualize data with grouped bar chart and stacked bar chart

Two bar charts are produced by the code to show malevolent or illegal attacks on five different industry sectors. For clarity, different colors are used to compare assault kinds inside each sector in the grouped bar chart. The stacked bar chart stacks various attack kinds to highlight the cumulative impact of each attack type and displays the total number of attacks per sector. Both charts feature efficient labeling and color coding to provide a clear and thorough perspective of the data.

In [5]:
```
import pandas as pd
import matplotlib.pyplot as plt

# Read the CSV file into a DataFrame
file_name = 'Malicious_or_criminal_attacks_breakdown-Top_five_sectors_July-Dec-2023.csv'
df = pd.read_csv('Malicious_or_criminal_attacks_breakdown-Top_five_sectors_July-Dec-2023.csv', index_col=0, engine='python')

# Data for plotting
sectors = df.columns
attack_types = df.index
colors = ['red', 'yellow', 'blue', 'green']

# Create subplots
fig, (ax1, ax2) = plt.subplots(nrows=1, ncols=2, figsize=(14, 9), dpi=100)

# Grouped Bar Chart
width = 0.2  # Width of the bars
x = range(len(sectors))  # X locations for the groups

for i, attack_type in enumerate(attack_types):
    ax1.bar([p + width*i for p in x], df.loc[attack_type], width, label=attack_type, color=colors[i])

ax1.set_xlabel('Top five industry sectors')
ax1.set_ylabel('Number of attacks')
ax1.set_title('Malicious or criminal attack breaches - Top 5 sectors')
ax1.set_xticks([p + 1.5 * width for p in x])
ax1.set_xticklabels(sectors, rotation=90)
ax1.legend(title='Attack types')

# Show values on top of bars
for bars in ax1.containers:
    ax1.bar_label(bars)

# Stacked Bar Chart
bottom = [0] * len(sectors)
for i, attack_type in enumerate(attack_types):
    ax2.bar(sectors, df.loc[attack_type], bottom=bottom, label=attack_type, color=colors[i])
    bottom = [i+j for i, j in zip(bottom, df.loc[attack_type])]

ax2.set_xlabel('Top five industry sectors')
ax2.set_ylabel('Number of attacks')
ax2.set_title('Malicious or criminal attack breaches - Top 5 sectors')
ax2.set_xticklabels(sectors, rotation=90)
ax2.legend(title='Attack types')

plt.tight_layout()
plt.show()
```


Malicious or criminal attack breaches – Top 5 sectors
Attack types
Cyber incident
Social engineering / impersonation
Rogue employee / insider threat
Theft of paperwork or data storage device
Number of attacks
Health service providers
Finance (incl. superannuation)
Insurance
Retail
Australian Government
Top five industry sectors
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