Crime Data Analysis Report

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🔎 Project Overview

This report presents a comprehensive analysis of crime incidents recorded between **2020 and 2025**, using an interactive Power BI dashboard.
The goal is to transform raw crime data into meaningful insights by examining **crime trends, demographic patterns, crime code distribution, time-based variations**, and the **severity and nature of different offenses**.

The dashboard delivers a unified analytical view using:

- Slicers for dynamic filtering
- A tooltip-powered donut chart for crime code interpretation
- Interactive visuals for demographic segmentation
- Time-series analysis for crime evolution across years, quarters, and months

This analysis is intended to support **public safety agencies**, **policy makers**, and **crime analysts** in understanding crime patterns and making data-driven decisions.

🎯 Business Problem & Objectives

- The goal is to transform raw crime data into meaningful insights by examining **crime trends, demographic patterns, crime code distribution, time-based variations**, and the **severity and nature of different offenses**.

📂 Dataset

File: Crime_Data_from_2020_to_2025.csv
Total Records: ~860,000
Unique Crime Codes: 139
Timeline: 2020–2025 (with partial data in 2025)

Key Columns Used:

- Register Number
- Crime Code (Crm Cd)
- Crime Code Description
- Victim Age & Sex
- Crime Status (IC, AA, AO, etc.)
- Date (Year, Quarter, Month extracted)

🛠 Tools & Techniques

Power BI – DAX Formulas, Cleaning Dataset, Charts & Visualisation

- **Power BI Desktop** Data cleaning, formatting, type corrections
- **Tooltip** for interactive graphics
- **Top-N Filtering**
- **Interactive slicers & tooltips**

Data Cleaning & Preparation

All preprocessing was done in **Power Query (Power BI)**. Steps include:

Cleaning

- Removed duplicate register numbers
- Standardized victim sex values (M, F, X, H, O)
- Removed rows with null or corrupted key fields
- Verified formats for dates, crime codes, and status categories

Feature Engineering

- Extracted **Year**, **Quarter**, **Month** from date
- Created **Age Categories:**
  - *Child (0–17)*
  - *Young (18–30)*
  - *Adult (31–50)*
  - *Senior (50+)*
- Mapped **crime codes** to descriptions using a separate tooltip page
- Built relationships between tables to support filtering & drill-down

Analysis Performed

High-Level KPIs

- **Total Crime Records:** ~860K
- **Unique Crime Codes:** 139

These KPIs help assess dataset depth and crime variety across the U.S.

Crime Code Distribution (Donut Chart + Tooltip)

A donut chart shows the proportion of incidents by crime code (numeric).
Because crime codes are cryptic, the dashboard uses a **dedicated tooltip page**:

When a user hovers over a crime code slice:
➞ A tooltip shows **all crime descriptions & offenses** tied to that code.

Value:
This preserves a clean visual design while giving immediate access to detailed offense descriptions.

Victim Demographics Analysis

Age Trends:

- Peak victim age: **30–35 years**
- Largest affected group: **Adults (31–50)**
- Next largest: Young (18–30)
- Least affected: Children & Senior Citizens

Sex Breakdown:

- Males: **403K**
- Females: **358K**
- Others/Unknown: ~100K

Interpretation:
Crime disproportionately impacts adults, with male victims representing the majority.

Crime Status Segmentation

Crime statuses such as IC (Investigation Continued), AO (Arrested/Other), AA (Adult Arrested) were analyzed.

Key finding:

- **IC category had the highest aggregated crime code totals**, indicating many cases move forward into active investigation.

Time-Series Analysis

A Year–Quarter–Month hierarchy reveals crime evolution:

- Crime incidents **increased from 2020 → 2023**
- Stabilized in **2024**
- Early **2025 shows a decline**, but note partial data
- Seasonal peaks commonly appear in spring–summer

Age Category × Sex Interaction

Cross-visualization shows the intersection:

- Adult Males → Highest incident count
- Young Males → Second highest
- Female victims increase slightly in the 31–40 age range
- Children and Seniors form much smaller proportions

Crime Description Trends (Tooltip Page)

The tooltip page lists the offenses connected to each crime code.
Top frequent offenses include:

- Battery
- Vandalism
- Theft
- Burglary

This bridges numerical crime codes with meaningful descriptions for non-technical stakeholders.

📌 Key Insights

Crime Volume & Codes

- ~860K incidents analyzed
- 139 unique crime codes
- Battery, Vandalism, Theft are most common

Demographics

- Victims are majorly **Adults (31–50)**
- Males form the largest demographic
- Peak victim age: **30–35**

Time Trends

- Crimes increase through 2020–2023
- Stabilization in 2024
- Dip in 2025 (incomplete data)

Crime Status

- IC (Investigation Continued) dominates crime statuses
- Indicates high investigative activity

Tooltip UX

- Numeric crime codes become fully interpretable
- Dashboard becomes accessible for officers, analysts, and policymakers

Recommendations

Conclusion

The Crime Trends & Demographics Dashboard provides a unified analytical system to understand crime patterns across the U.S.
The use of **demographic segmentation, time analysis, and tooltip-enabled crime descriptions** creates a practical and operationally valuable intelligence tool.

Recommendations

- Prioritize **preventive measures for adults**, especially males aged 25–40
- Consider deeper analysis of top criminal categories (Battery, Theft, Burglary)
- Validate 2025 data completeness before taking policy decisions
- Add **geospatial mapping** in the next dashboard version to identify hotspots
- Integrate socio-economic datasets for root-cause analysis

Executive Summary

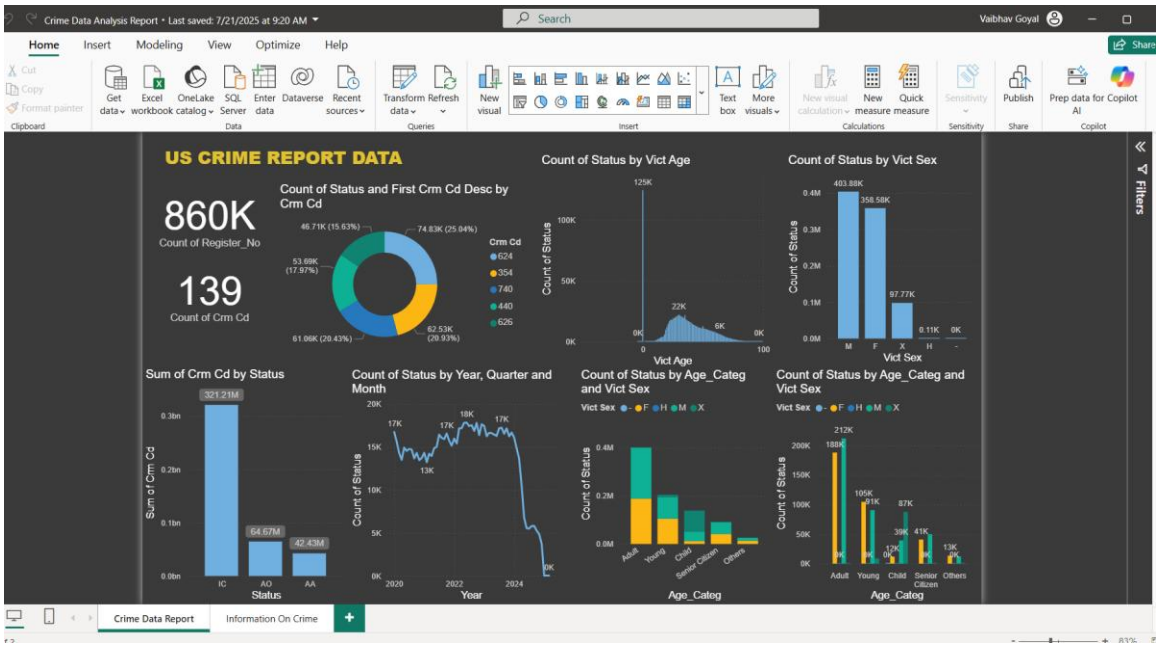
The Crime Trends & Demographics Dashboard analyzes **860K+ crime incidents** from 2020–2025.
Adults aged 31–50 are most affected, with male victims forming the majority.
Battery, Vandalism, and Theft dominate the offense categories.
Crimes peaked during 2021–2023, stabilizing in 2024 with early decline in 2025.
A unique tooltip system reveals detailed crime descriptions when hovering over numeric crime codes, making the dashboard intuitive and powerful.

This report provides actionable insights for:

- **Law enforcement**
- **Policy analysts**
- **Public safety planning**
- **Academic researchers**

Dashboard & Visuals

Screenshot of the Dashboard:



- **Tooltip:**