
Business Intelligence Reporting for Social Assistance Programs using Power BI

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Introduction

Social assistance programs require continuous monitoring to ensure equitable coverage, effective participation, and efficient resource allocation across regions. Business Intelligence tools provide decision-makers with interactive and data-driven insights to support policy evaluation and intervention planning.

1.2 Objectives

The objective of this project is to design an interactive Power BI reporting system that enables monitoring of program usage, regional coverage, temporal trends, and identification of high-need regions requiring priority intervention.

1.3 Tools Used

Keeping it simple and professional.

- Power BI Desktop
 - DAX (Data Analysis Expressions)
 - Cleaned assistance datasets
-

2 Data Description

2.1 Dataset Overview

The dataset includes yearly information on social assistance programs, covering regional identifiers, coverage rates, participation rates, benefit per capita, and coverage change indicators.

2.2 Key Variables Used

Variable	Description
ID_Assistance	Assistance program identifier
ID_Region	Regional identifier
Date	Year
Coverage_rate	Percentage of population covered
Participation_rate	Participation level
Benefit_per_capita	Average benefit
Coverage_change	Yearly change in coverage

3 Dashboard Architecture

The reporting solution is structured into multiple dashboards, each addressing a specific analytical dimension: overview monitoring, regional comparison, temporal evolution, and performance quality assessment.

4 Dashboard 1 — Home Page & Navigation

Purpose

The Home page serves as the entry point to the report, guiding users through the dashboards via interactive navigation buttons.

Features

- Page navigation buttons
- Clear project objective
- Improved user experience

Advanced Aspect

Interactive navigation
Ergonomic design

5 Dashboard 2 — Overview Dashboard

Purpose

Provide a high-level summary of national performance indicators.

Visuals Used

- KPI cards (Average Coverage, Participation, Benefit)
- Summary charts

Insights

This dashboard enables rapid assessment of the overall program performance.

6 Dashboard 3 — Regional Coverage Dashboard

Purpose

Identify regional disparities in coverage and participation.

Visuals Used

- Regional bar charts / maps
- Slicers (Region, Year, Assistance)

Interactivity

Dynamic filtering

Cross-visual interaction

7 Dashboard 4 — Trends & Evolution

Purpose

Analyze yearly evolution of coverage and participation indicators.

Visuals Used

- Line charts (Coverage_rate over time)
- Region-based filtering

Insights

This dashboard highlights improving or declining trends across regions.

8 Dashboard 5 — Performance Quality Dashboard (KEY PAGE)

Purpose

Identify underperforming regions and support decision-making through prioritization.

8.1 Advanced DAX Indicators

Advanced DAX measures were implemented to compute national averages, regional gaps, and a composite need score using benchmarking and conditional logic.

- CALCULATE
 - ALL
 - VAR
 - Conditional logic
-

8.2 Need Score (Advanced Technique)

A composite need score was designed to combine coverage gaps, participation gaps, and negative coverage trends. This score enables ranking regions according to urgency of intervention.

8.3 Visuals & Alerts

- KPI cards (Min, Max, National Average)
 - Coverage gap bar chart
 - Top 10 regions by need score
 - Conditional formatting (red / green)
-

8.4 Decision Support Value

This dashboard transforms descriptive indicators into actionable insights by highlighting priority regions requiring targeted policy intervention.

9 Interactivity & Advanced Techniques Summary

Interactivity

- Slicers
- Page navigation
- Cross-filtering
- Dynamic recalculation of measures

Advanced Techniques

- Benchmarking vs national average
 - Composite indicators (need score)
 - Conditional formatting
 - Top-N prioritization
 - Tooltips / drill-through (if used)
-

REQUIRED BASE MEASURES

1 Average Coverage

```
Avg Coverage =  
AVERAGE(assistance_SA[Coverage_rate])
```

2 Average Participation

```
Avg Participation =  
AVERAGE(assistance_SA[Participation_rate])
```

3 National Average Coverage

```
National Avg Coverage =  
CALCULATE(  
    [Avg Coverage];  
    ALL(assistance_SA)  
)
```

4 National Average Participation

```
National Avg Participation =  
CALCULATE(  
    [Avg Participation];  
    ALL(assistance_SA)  
)
```

5 Coverage Gap (Region vs National)

```
Coverage Gap =  
[Avg Coverage] - [National Avg Coverage]
```

6 Participation Gap (Region vs National)

```
Participation Gap =  
[Avg Participation] - [National Avg Participation]
```

7 Coverage Gap Score

```
Coverage Gap Score =  
IF(  
    [Coverage Gap] < 0;  
    ABS([Coverage Gap]);  
    0  
)
```

8 Participation Gap Score

```
Participation Gap Score =  
IF(  
    [Participation Gap] < 0;  
    ABS([Participation Gap]);  
    0  
)
```

9 Negative Coverage Trend

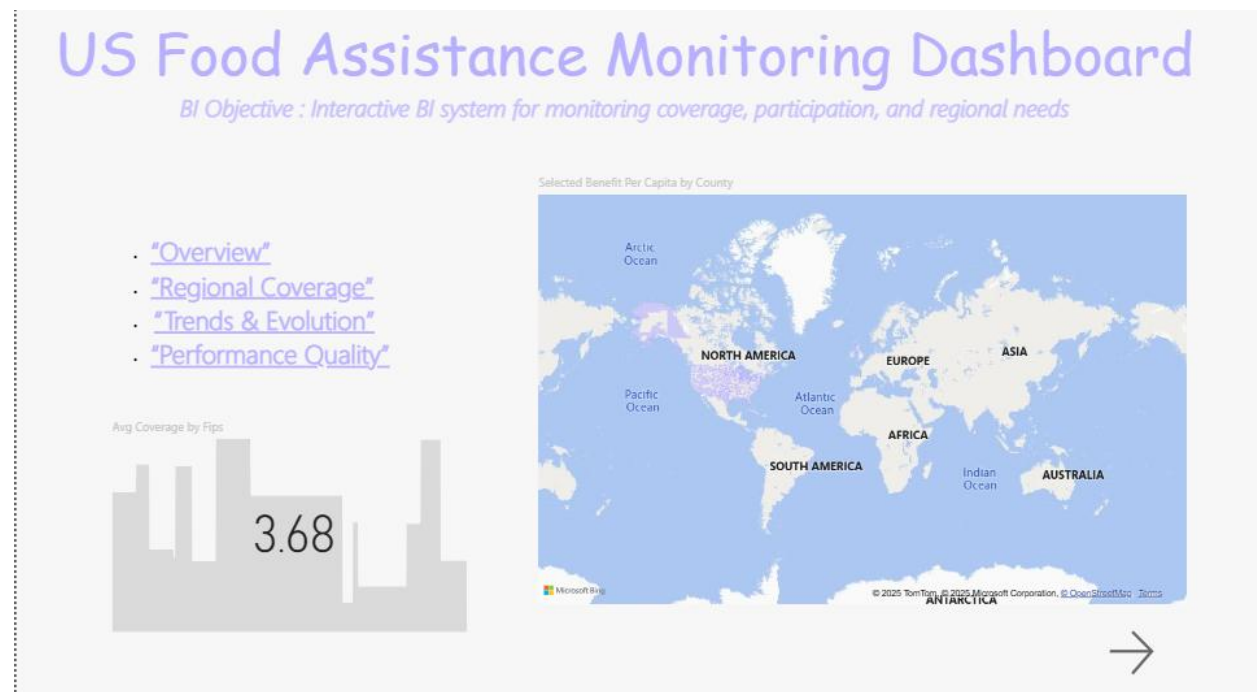
```
Negative Trend =  
IF(  
    AVERAGE(assistance_SA[Coverage_change]) < 0;  
    1;  
    0  
)
```

FINAL NEED SCORE (MAIN MEASURE)

Need Score:

```
Need Score =  
VAR cov =  
    [Coverage Gap Score]  
VAR part =  
    [Participation Gap Score]  
VAR trend =  
    [Negative Trend]  
RETURN  
    (cov * 0.5)  
    + (part * 0.3)  
    + (trend * 0.2)
```

Dashboard screenshots



Overview

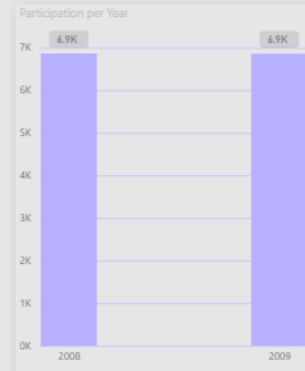
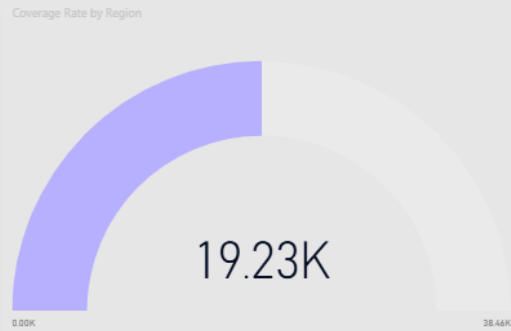
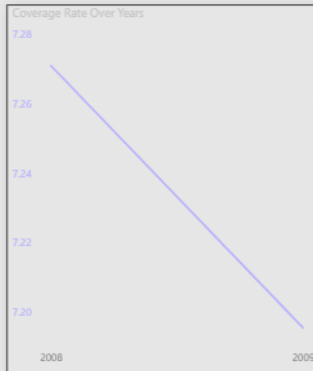


Average Coverage Rate
3.05

Average Participation Rate
6.20K

Average Benefit Per Capita
-29.40

Avg Coverage Change
7.48



Regional Coverage Dashboard

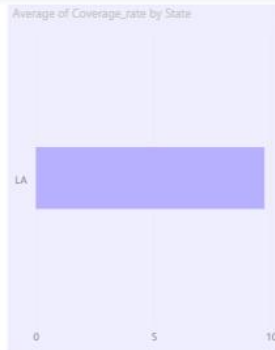
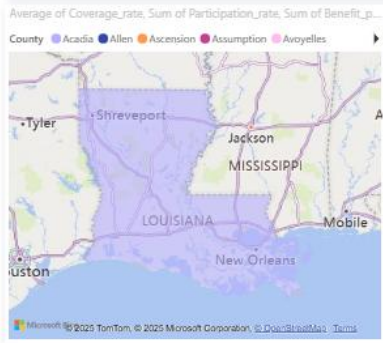
7.20K
Selected Region Participation

24.88
Selected Benefit Per Capita

9.71
Selected Region Coverage

Select a State

Adjuntas	Aguada	Aguadilla
Aguas Buenas	Aibonito	AK
AL	Anasco	AR

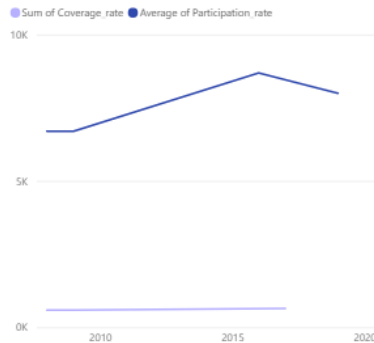


Regional Detail Table

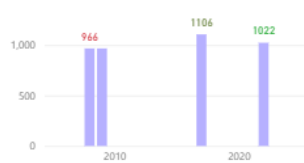
State	County	Coverage_rate	Participation_rate	Benefit_per_capita	Coverage_change	Date
LA	Acadia	9.71	7,200.00	24.80	16.11	2008
LA	Acadia	9.71	7,200.00	24.80	16.11	2009
LA	Allen	9.71	7,200.00	22.62	16.11	2008
LA	Allen	9.71	7,200.00	22.62	16.11	2009
LA	Ascension	9.71	7,200.00	19.64	16.11	2008
LA	Ascension	9.71	7,200.00	19.64	16.11	2009
LA	Assumption	9.71	7,200.00	19.37	16.11	2008
LA	Assumption	9.71	7,200.00	19.37	16.11	2009
LA	Avoyelles	9.71	7,200.00	33.58	16.11	2008
LA	Avoyelles	9.71	7,200.00	33.58	16.11	2009
LA	Beauregard	9.71	7,200.00	18.29	16.11	2008
LA	Beauregard	9.71	7,200.00	18.29	16.11	2009
LA	Bienville	9.71	7,200.00	27.64	16.11	2008
LA	Bienville	9.71	7,200.00	27.64	16.11	2009
LA	Bossier	9.71	7,200.00	16.50	16.11	2008
LA	Bossier	9.71	7,200.00	16.50	16.11	2009
LA	Caddo	9.71	7,200.00	25.78	16.11	2008
LA	Caddo	9.71	7,200.00	25.78	16.11	2009
LA	Calcasieu	9.71	7,200.00	19.67	16.11	2008
LA	Calcasieu	9.71	7,200.00	19.67	16.11	2009
LA	Caldwell	9.71	7,200.00		16.11	2008
LA	Caldwell	9.71	7,200.00		16.11	2009
LA	Cameron	9.71	7,200.00		16.11	2008
LA	Cameron	9.71	7,200.00		16.11	2009
LA	Catahoula	9.71	7,200.00		16.11	2008
LA	Catahoula	9.71	7,200.00		16.11	2009

Time-Series Analysis

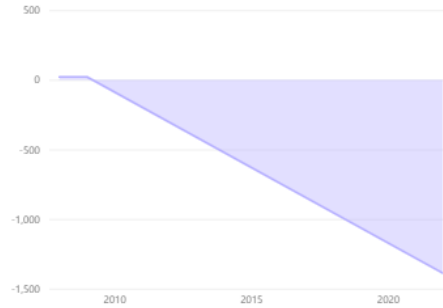
Sum of Coverage_rate and Average of Participation_rate by Date



Sum of Coverage_change by Date



Average of Benefit_per_capita by Date



Sum of Coverage_rate by Date and State

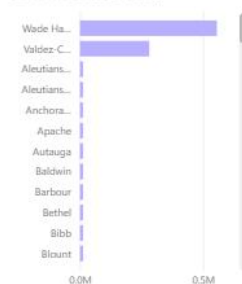


State, County

- ☐ (Blank)
- ☐ Adjuntas
- ☐ Aguada
- ☐ Aguadilla
- ☐ Aguas Buenas
- ☐ Albonito
- ☐ AK
- ☒ AL
 - ☒ Autauga
 - ☒ Baldwin
 - ☒ Barbour
 - ☒ Bibb
 - ☒ Blount
 - ☒ Bullock
 - ☒ Butler
 - ☒ Calhoun
 - ☒ Chambers
 - ☒ Cherokee
 - ☒ Chilton
 - ☒ Choctaw
 - ☒ Clarke
 - ☒ Clay
 - ☒ Cleburne
 - ☒ Coffee
 - ☒ Colbert
 - ☒ Conecuh
 - ☒ Coosa
 - ☒ Covington
 - ☒ Crenshaw
 - ☒ Cullman
 - ☒ Dale
 - ☒ Dallas

County	Sum of Need Score
Wade Hampton	588,572.68
Valdez-Cordova	281,541.93
Aleutians East	13,041.33
Aleutians West	13,041.33
Anchorage	13,041.33
Apache	13,041.33
Autauga	13,041.33
Baldwin	13,041.33
Barbour	13,041.33
Bethel	13,041.33
Bibb	13,041.33
Blount	13,041.33
Bristol Bay	13,041.33
Bullock	13,041.33
Total	2,665,307.28

Sum of Need Score by County



Sum of Need Score by State



Clear all slicers

County, State

- ☐ Abbeville
- ☐ Acadia
- ☐ Accomack
- ☐ Ada
- ☐ Adair
- ☐ Adams
- ☐ Addison
- ☐ Aiken
- ☐ Altamonte
- ☐ Alachua

County	Sum of Need Score
Aleutians East	13,041.33
Aleutians West	13,041.33
Anchorage	13,041.33
Apache	13,041.33
Autauga	13,041.33
Baldwin	13,041.33
Barbour	13,041.33
Bethel	13,041.33
Bibb	13,041.33
Blount	13,041.33
Bristol Bay	13,041.33
Bullock	13,041.33
Butler	13,041.33
Calhoun	13,041.33
Total	2,665,307.28

Limitations

The analysis is based on yearly data, which limits real-time monitoring. Future work could integrate higher-frequency data for more granular analysis. We already talked about this issue in the validation me and Mme Olfa Layouni .

Conclusion

This project demonstrates the use of advanced Power BI reporting techniques to monitor social assistance programs. By combining interactive dashboards, advanced DAX calculations, and decision-oriented design, the solution provides an effective tool for policy analysis and regional performance monitoring.
