

Using GenAI to Enhance Statistical Reporting

UNICEF Data & Analytics Section

III-rd CIS International Statistical Forum
Prospects of Statistics: International Projects

September 24-26, 2025, Baku, Republic of Azerbaijan

AI Challenge / AI Possibility

National Statistical Offices have long served as a **key enabler for evidence-based policy** and reliable government decision making.

But the landscape is shifting:

- AI technology is evolving faster than our ability to make use of it.
- The public sphere is increasingly influenced by non-traditional data sources.
- Trust in data, even official data, is fragile.

Our shared challenge: How do we **safeguard the credibility of official data and statistics**, while **embracing new tools** that allow us to deliver faster, focused, ever more relevant insights?

GenAI: A Flexible Tool for the Data Lifecycle

While uncertainty remains, the **promise of GenAI for official data and statistics is immense**. Across the data lifecycle, new capabilities are emerging. A few examples:

- **Survey Design:** LLMs can test question clarity, simulate interviews, and propose cultural adaptations.
- **Data Processing:** Natural language interfaces accelerate pipeline debugging, cleaning, and recoding.
- **Analysis:** AI can support fast exploratory analysis, anomaly detection, and summarization.
- **Reporting:** GenAI enables tailored narratives, visual summaries, and multi-audience outputs.
- **Localization:** AI agents can generate district-specific narratives in multiple languages.

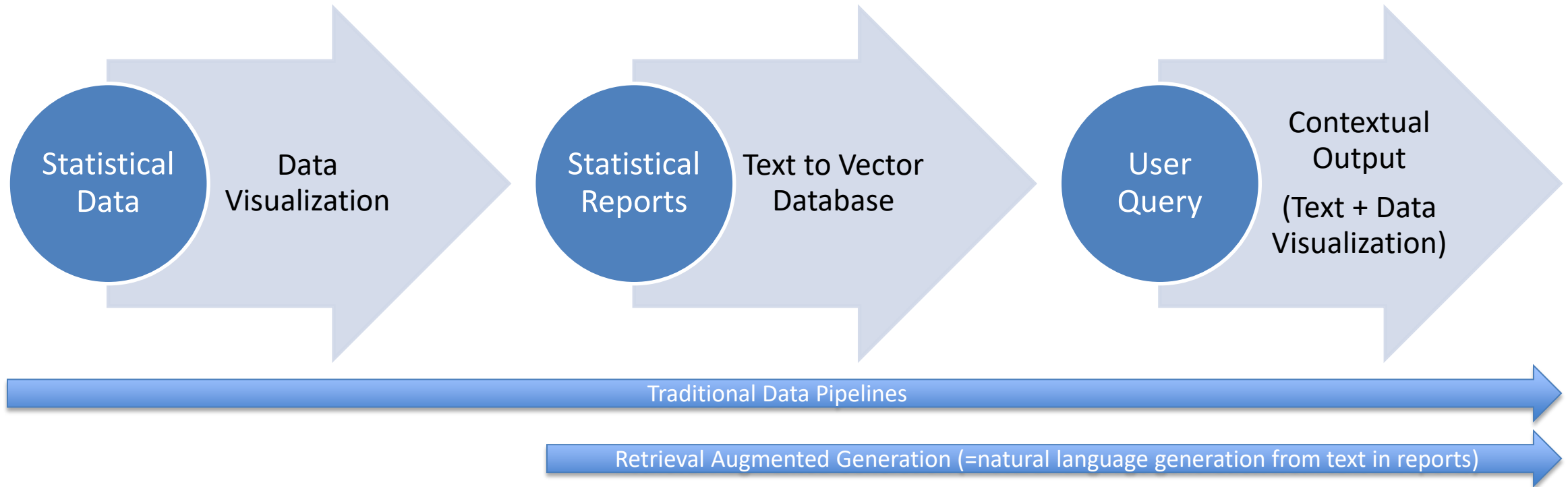
Our Approach: Move Fast ~~and~~ *do not* Break Things

UNICEF is exploring GenAI **guided by principles** of:

- **Guardrails:** Limiting scope of use to reduce hallucination risk.
- **Augmentation:** Supporting, not replacing, human analysts.
- **Test Test Test:** Logging usage, using disclaimers, and building in strong QA workflows.

Three **current field-tested experiments** are helping us assess **feasibility, safety, and value!**

Stats GenAI: Practical View



Test Case 1 – SDG Report Chatbot

Data Communications Team



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Data Communications Team

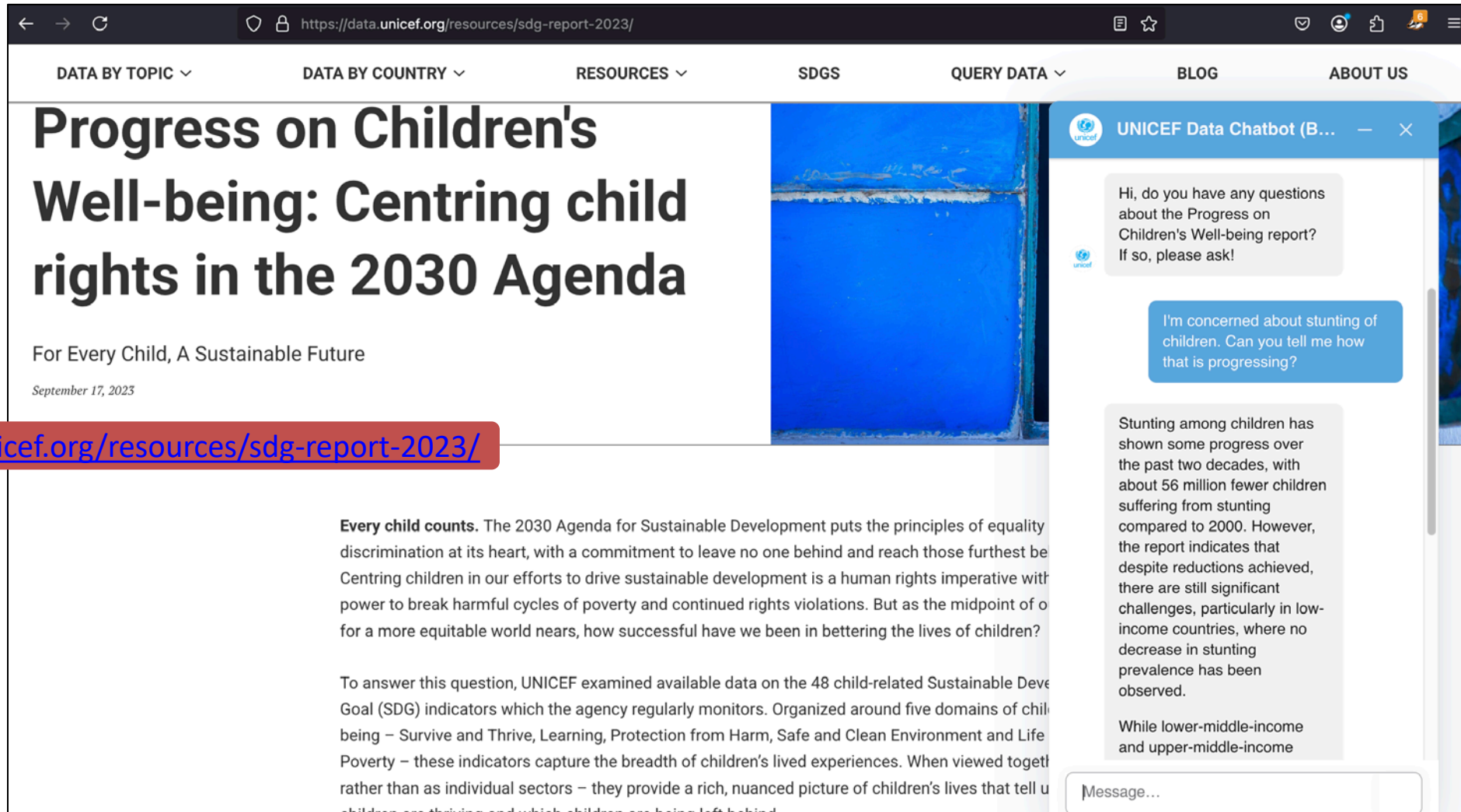
Challenge: surveying our users told us that our **98-page SDG report** was difficult to navigate.

Solution: A chatbot built over a single flagship document using Chat GPT-4o-mini.

- Scope designed to **only answer questions grounded in the PDF**.
- Out-of-scope queries receive **standard disclaimers**.
- **Human-in-the-loop QA** to thoroughly test quality.
- Cost controls(!) and **user feedback** mechanisms implemented.

Impact: Improved **access and understanding** without sacrificing statistical rigor.

Rapid Flexible Summaries



← → ↺ <https://data.unicef.org/resources/sdg-report-2023/> ☆ 🔒

DATA BY TOPIC ▾ DATA BY COUNTRY ▾ RESOURCES ▾ SDGS QUERY DATA ▾ BLOG ABOUT US

Progress on Children's Well-being: Centring child rights in the 2030 Agenda

For Every Child, A Sustainable Future

September 17, 2023

<https://data.unicef.org/resources/sdg-report-2023/>

Every child counts. The 2030 Agenda for Sustainable Development puts the principles of equality discrimination at its heart, with a commitment to leave no one behind and reach those furthest be Centring children in our efforts to drive sustainable development is a human rights imperative with power to break harmful cycles of poverty and continued rights violations. But as the midpoint of o for a more equitable world nears, how successful have we been in bettering the lives of children?

To answer this question, UNICEF examined available data on the 48 child-related Sustainable Deve Goal (SDG) indicators which the agency regularly monitors. Organized around five domains of chil being – Survive and Thrive, Learning, Protection from Harm, Safe and Clean Environment and Life Poverty – these indicators capture the breadth of children's lived experiences. When viewed togeth rather than as individual sectors – they provide a rich, nuanced picture of children's lives that tell u children are thriving and which children are being left behind.

UNICEF Data Chatbot (B... — ×

Hi, do you have any questions about the Progress on Children's Well-being report? If so, please ask!

I'm concerned about stunting of children. Can you tell me how that is progressing?

Stunting among children has shown some progress over the past two decades, with about 56 million fewer children suffering from stunting compared to 2000. However, the report indicates that despite reductions achieved, there are still significant challenges, particularly in low-income countries, where no decrease in stunting prevalence has been observed.

While lower-middle-income and upper-middle-income

Message...

Test Case 2 – AHEAD: Localized Narratives for Health

Health Analytics Team



Test Case 2 – AHEAD: Localized Narratives for Health

Health Analytics Team

Challenge: contextualizing public health administrative data across hundreds of districts.

Solution: Scripted R-generated analytics from admin data sources together with a vector database of regularly updated health reports passed into AI prompts for narrative output.

- Narrative generation **based on actual policies and local context** with vector database built on consistently updated national and local reports.
- **District-specific outputs** with clear recommendations based on local reporting.
- Mixture of “traditional” **scripted data generation** and visualization, connected with well-engineered **data pipelines**, and then **enhanced with GenAI narration** capabilities.
- **Challenge areas:** Calibrating AI narration with precise prompt engineering, controlling hallucinations, ensuring output transparency.

Impact: Hyper-localized and actionable data-driven narratives generated at scale.

Actionable Reporting that is Frequent and Local

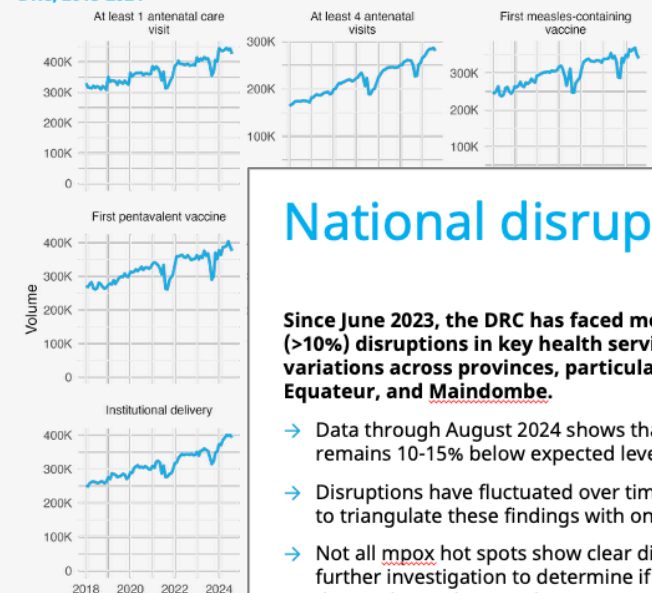
Overall trends

Based on the utilization trends, BCG was removed from the analysis since the utilization is not consistent enough for a reliable prediction. The start point for the analysis was selected as February 2022, after the disruptions in 2021 and the rollout of HMIS in 2019

- Most essential health services have shown an increasing volume since 2018, reflecting an increasing number of health facilities reporting into the HMIS system and expanding coverage of basic services.
- The introduction of free health services for pregnant women and newborns in about half of the provinces in late 2023 corresponds with a noticeable increase in the volume of essential services.
- Volume trends show clear historical disruptions in 2021 and 2023, highlighting the fragility of the DRC's health system, which is prone to health worker strikes and epidemics, including measles, cholera, and Ebola.
- Given the history of disruptions, the ongoing Mpox epidemic in 2023-2024 poses a significant risk to service continuity, potentially exacerbating existing vulnerabilities within the health system.

Due to inconsistent pre-crisis volume, utilization predictions are suggestive. All results should be triangulated.

Monthly service utilization for tracer services
DRC, 2018-2024



National disruption

Since June 2023, the DRC has faced moderate (>5%) to severe (>10%) disruptions in key health services, with notable variations across provinces, particularly in Kongo Central, Equateur, and Maitindombe.


- Data through August 2024 shows that reporting completeness remains 10-15% below expected levels due to delays.
- Disruptions have fluctuated over time, underscoring the need to triangulate these findings with on-the-ground insights.
- Not all mpox hot spots show clear disruptions, requiring further investigation to determine if this reflects resilience during the epidemic or limitations in data and reporting.


Cumulative % utilization change compared to expected
Tracer Indicators, June 2023 and August 2024, DRC, DHIS2

	At least 1 antenatal care visit	At least 4 antenatal visits	First measles-containing vaccine	First pentavalent vaccine	First postnatal care visit	Fully vaccinated with pentavalent vaccine	Institutional delivery	Outpatient visits
Tshuapa	2%	1%	2%	5%	2%	3%	3%	6%
Tshopo	-1%	-2%	-1%	-1%	-6%	-1%	-6%	-5%
Tanganyika	10%	17%	3%	3%	12%	4%	13%	11%
Sud Ubangi	17%	9%	3%	12%	15%	12%	17%	14%
Sud Kivu	9%	15%	5%	5%	23%	4%	21%	3%
Sankuru	2%	-1%	0%	7%	-4%	6%	-3%	3%
Nord Ubangi	6%	4%	7%	0%	4%	0%	2%	2%
Nord Kivu	6%	-1%	1%	7%	4%	12%	5%	-3%
Mongala	-1%	-2%	2%	4%	4%	4%	0%	-7%
Maniema	4%	3%	6%	6%	-5%	6%	-3%	4%
Maitindombe	-4%	-11%	-2%	1%	-5%	0%	-4%	1%
Lualaba	15%	3%	20%	22%	6%	23%	7%	7%
Lomami	4%	3%	1%	0%	-1%	1%	1%	6%
Kwilu	7%	6%	6%	5%	4%	6%	5%	8%
Kwango	6%	-1%	5%	6%	4%	4%	4%	10%
Kongo Central	-7%	-15%	5%	7%	-14%	5%	-13%	-9%
Kinshasa	11%	12%	10%	10%	15%	9%	14%	11%
Kasai Oriental	3%	4%	7%	7%	2%	6%	3%	0%
Kasai Central	3%	0%	5%	2%	3%	2%	5%	-1%
Kasai	5%	4%	-1%	-10%	5%	-11%	6%	-1%
Ituri	4%	0%	3%	5%	0%	5%	2%	-6%
Haut Uele	9%	-3%	3%	4%	-3%	5%	-3%	2%
Haut Lomami	6%	3%	3%	7%	7%	6%	9%	5%
Haut Katanga	10%	1%	13%	17%	4%	16%	5%	0%
Equateur	-7%	-4%	-5%	6%	-6%	7%	-7%	-12%
Bas Uele	-1%	-3%	0%	-1%	-7%	0%	-11%	-2%

Case 3 – GEN-SDG: Enhancing SDG Country Briefs

Frontier Data Network

unicef  | for every child



UNICEF SDG Country Profile Contextualizer

This tool uses SDG Country Profiles and economic data from the World Bank and other sources to provide a high-level overview of a country's progress towards meeting its SDGs.

Which country do you want to generate a report for? *

Select Which country do you want to:

What do you want this report to focus on? *




A broad summary of what is working

A broad summary of what is working well and what is not working well ✓

A detailed report of the progress of the country

Generate

Report

  Download 

Frontier Data Technology Unit | Yves Jaques yjaques@unicef.org

Case 3 – GEN-SDG: Enhancing SDG Country Briefs

Frontier Data Network

Challenge: New SDG benchmarking methods are rigorous but complex to interpret.

Solution: Retrieval-Augmented Generation (RAG) prototype built with MIT Sloan.

- AI-generated narratives over SDG benchmarking PDFs using various role-based summaries.
- Live integration of additional World Bank data for economic context.
- Evaluated for accuracy and tailored messaging.

Impact: Role-based prompts with GenAI can facilitate analytic outputs tailored to diverse audiences

Lessons: GenAI parsing of Data visualization remains problematic, scripted outputs of structured data into visualizations still more reliable in this area. Hybrid approach best!

Customised Views Over a Set of Reports

A broad summary of what is working 

Generate

Report  Download 

Afghanistan's Progress on Sustainable Child Development Goals: A Comprehensive Report

Executive Summary

This report provides a structured assessment of Afghanistan's progress toward the 2030 Sustainable Development Goals (SDGs) for children, focusing on five thematic areas: Survive and Thrive, Learning, Protection from Harm, Safe and Clean Environment, and Life Free of Poverty. The analysis draws on the latest available data, benchmarking Afghanistan's performance against regional and income group peers,

attention, offering actionable insights for policymakers and stakeholders.

Economic Snapshot

Afghanistan's economic and fiscal environment has sharply deteriorated since 2021, with significant negative implications for children's well-being and the country's progress toward the SDGs. Key economic indicators show regression, threatening

https://data.unicef.org/wp-content/plugins/wp_dataexplorer/index_cfg/UnicefStackAI/UnicefStackAI.html

Where Next? Responsible GenAI in Official Statistics

Where do we see opportunities for further integration of GenAI?

- **Role-aware outputs:** clear value in generating custom formats for user groups: directors, researchers, private sector, general public.
- **Data-grounded generation:** further testing to anchor AI on structured official data, eliminating (minimizing?) hallucination risk .
- **Shared QA infrastructure:** collaboration across the official data and statistics community: prompt libraries, evaluation methods, results.
- **Field-first design:** deploying responsible tools that are usable by local staff requiring little engineer and analyst intervention.
- **Transparent methods:** test where and how we can produce result reproducibility where source data fed to models is opaque.

Final Reflections

GenAI will either foster or impede the future of how we communicate official data and statistics. It is up to us to drive its responsible use to enhance our delivery. Our experience at UNICEF has shown us that:

- Statisticians, Data Scientists, Data and Software Engineers must **lead the way together**.
- Collectively **we have the experience over the data lifecycle** to design robust implementations that build strong **quality assurance** into AI innovation.
- **Probabilistic tools like GenAI can coexist** with our rigorous official methodologies when leveraged where their value is high (narrative augmentation, summarization, localization, contextualization, personalization)
- Trust is built through **process transparency** and **rigorous testing**.
- Most of your toolkit can be built **free** on **open-source**. **EXCEPT** for LLMs (DeepSeek, OpenAI, Claude, etc.).

We are **cautiously** hopeful that **GenAI can reinforce our ability** to generate timely and relevant analytics that **build public trust** in data in a world hungry for credible, actionable information.