Unique Privacy Considerations in Blending Disaster Data

Approaches and Case Studies from the Federal Emergency Management Agency

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Agenda

- FEMA's strategic landscape
  - FEMA's mission
  - Implications for our data and analytics
- Case studies addressing privacy considerations in blended data
  - U.S. Census data and FEMA's Individuals and Households Program (IHP)
  - Data sharing during the COVID-19 response
- Lessons learned about addressing privacy considerations in blended data
- Actions we are taking now
  - Policy
  - Technology
- Remaining challenges and recommendations

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FEMA's Strategic Landscape

Our Mission: Helping People Before, During, and After Disasters

BEFORE DISASTERS

We help the whole community understand risks to life and property and motivate action to reduce these risks, build capabilities, and prepare for disasters.

1. **Raise Risk Awareness**: We help identify and assess risks to life and property, and then collaborate with a wide range of partners to communicate risk information.
2. **Educate about Risk Reduction Options**: We educate individuals, communities, and the public to understand different options for reducing risk.
3. **Drive Individual Action**: We help individuals, communities, and organizations take action to mitigate, reduce risk, and build capabilities to prepare for disasters.

DURING DISASTERS

We message, mobilize, and coordinate in support of state, local, tribal, and territorial (SLTT) response efforts to stabilize communities.

1. **Alert, Warn, and Message**: We bring valuable insight to our partners during a disaster using our national-level perspective.
2. **Coordinate the Federal Response**: We organize ourselves and others to coordinate the Federal emergency response community.
3. **Apply and Manage Resources**: We bring together and deploy Federal resources that supplement SLTT capabilities to stabilize the disaster.

AFTER DISASTERS

We help individuals and communities recover after a disaster and build back stronger.

1. **Coordinate Federal Recovery Efforts**: We help facilitate problem-solving, improve access to resources, integrate principles of resilience, sustainability, and mitigation, and foster coordination among our partners after a disaster.
2. **Provide Resources**: We provide financial support and direct services to individuals, communities, governments, and nonprofit organizations to aid in their recovery.
3. **Apply Insight to Reduce Future Risk**: We offer insight, standards, resources, and tools for communities, businesses, and individuals to build back stronger.

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FEMA's Strategic Landscape

Implications for Data Sharing and Analysis

- Need to blend data that contains Personally Identifiable Information (PII) with other operational data sets
- Need to share PII and blended data with emergency management partners (federal agencies, SLTT partners, Non-governmental Organizations (NGOs), the private sector, the public) to inform decisions – while safeguarding information privacy and confidentiality
- Need to receive and process data from emergency management partners
- Need to evaluate performance and ensure equitable delivery of FEMA disaster programs while accounting for the large number of factors that are unique to each disaster

While these implications are not unique to FEMA, the short timelines for decision-making during disaster operations amplify the magnitude of these challenges.

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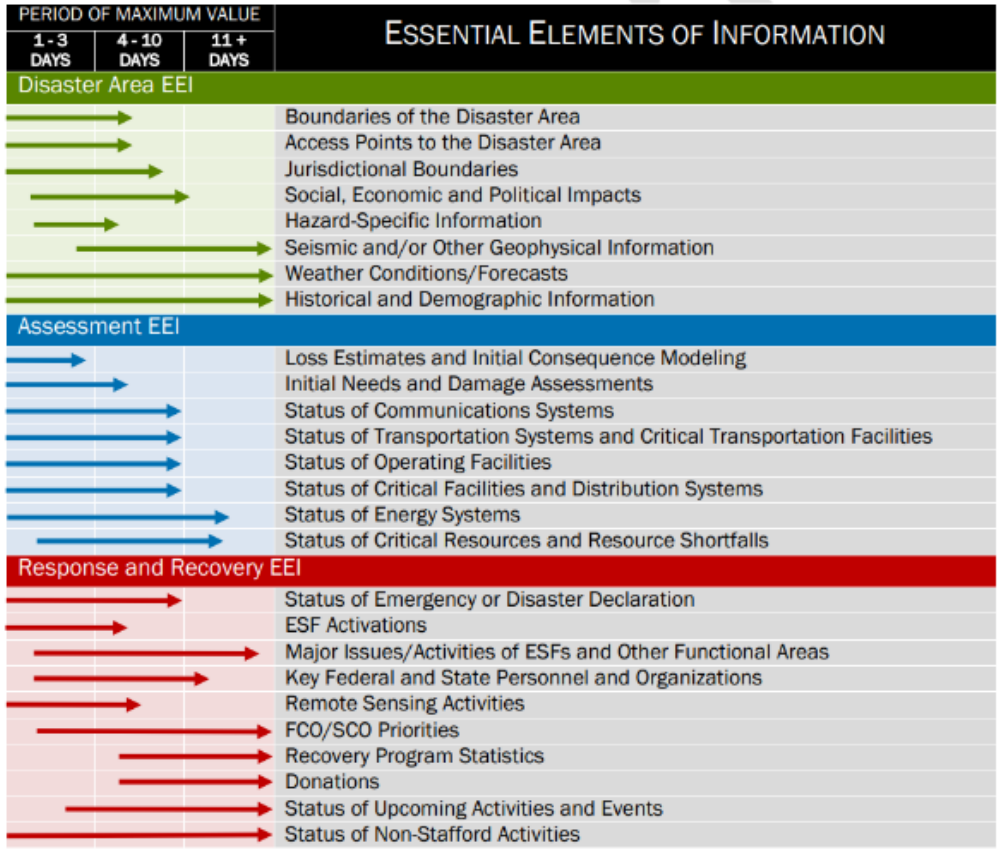
FEMA's Strategic Landscape

Example: Informing Decisions During Hurricane Response & Recovery

Time	Key Leader Decision
H-72h	Activate National Response Coordination Center (NRCC)
H-72h	Activate/Alert National Urban Search & Rescue (US&R) System
H-72h	Pre-Stage Logistics Commodities
H-72h	Deployment of National Incident Management Assistance Team(s) (N-IMAT)
H-72h	Pre-Deploy Emergency Support Function (ESF) Resources
H-72h	Pre-Deploy Initial Department of Defense Support, including Defense Coordinating Element (DCE)
H-72h	Requirement for Evacuation Support (e.g., Ambulance Contract)
H-48h	Recommendation to the President for a Stafford Act Declaration (Emergency – EM)
H+6h	Recommendation to the President for a Stafford Act Declaration (Disaster – DR)
H+24h	Requirement for Follow-on Emergency Support Function (ESF) Resources
H+24h	Requirement for Follow-on Logistics Commodities or Re-Distribution
H+24h	Requirement for Follow-on National Assets (Teams)
H+24h	Requirement for Follow-on Department of Defense (DoD) Resources
H+24h	Requirement for Additional Waivers, Exemptions, or Policy Decisions (Also: Functional Planning Requirements)

Selected decisions FEMA leaders make when managing hurricane response



Inputs needed by FEMA leaders to make those decisions

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Case Study 1

US Census Data and the Individuals & Households Program

Background Information

- The **Individuals and Households Program (IHP)** provides financial assistance and direct services to eligible individuals and households who have uninsured or underinsured necessary expenses and serious needs
- Example from Hurricane Ida (2021): FEMA processed 698,727 eligible IHP claims with an average award of $2,667

Decision Support Needs

- **What is the projected total amount of IHP funding to be awarded for a specific disaster declaration?**
- **Are there indicators that changes are needed in IHP delivery to achieve expected program performance?**
  - Example: Registrations in a specific area fall short of expected numbers (potential indicator of low IHP program penetration or equity concerns)
  - Example: Discrepancies between expected and actual figures (potential indicator of fraud)

FEMA's Analytic Approach

- **FEMA is working with the US Census Bureau to develop a micro-level (tract level) IHP Eligibility Index dataset**
  - Using a small area estimation methodology, incorporating datasets such as renters insurance from the American Household Survey
  - Work is currently underway, scheduled for completion this month (May 2023)
- Will then overlay additional FEMA data such as damage assessment and grants distribution, enabling us to address executive decision-making needs

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Case Study 1 (continued)

US Census Data and the Individuals & Households Program

Challenge: Maintaining Control of Access to FEMA's Data

- Administrative microdata from the U.S. Census Bureau (Census) is highly valuable for building forecasts of IHP registrations, but FEMA staff would need to obtain Special Sworn Status to access this data, which takes weeks (**not feasible in disaster timelines**)
- IHP registration data contains disaster survivor PII and requires data sharing agreements and legal/privacy review to share outside of FEMA
- Census employees are well-equipped to blend Census microdata and IHP registration data for research purposes, but **non-Census employees with Special Sworn Status also have the potential to access IHP data** once shared with Census, **which is a concern**

Solution: Swap IHP Registration Data for IHP Eligibility Data

- FEMA asked Census to **develop a dataset that blends Census microdata with IHP eligibility criteria**, instead of using IHP registration data.
  - This work is being sponsored by FEMA through a Memorandum of Understanding (MOU).
- The **IHP Eligibility Index dataset** is currently under development; the dataset and feasibility report will be completed at the end of May 2023, with further enhancements planned.
  - The dataset includes 3000 counties at the tract level, including Puerto Rico.
- This blended dataset is considered non-sensitive, aggregated data and will be made widely available to FEMA program offices and analysts upon completion and review.

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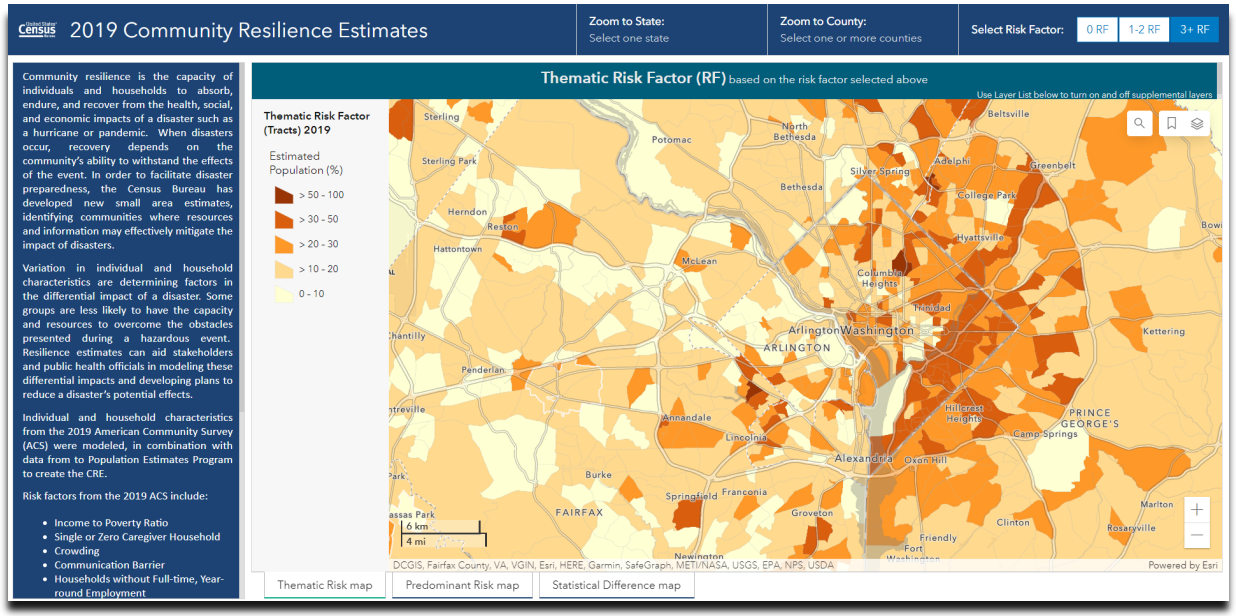
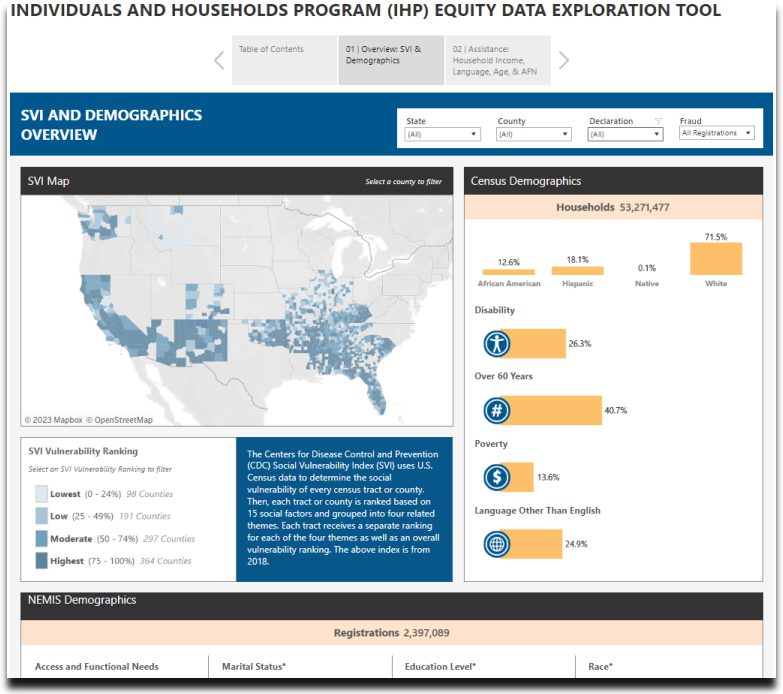
Case Study 1 (continued)

US Census Data and the Individuals & Households Program

Outputs that Illustrate our Blended Data Solutions



The "2019 Community Resilience Estimates" uses the same statistical techniques as the IHP Eligibility Index and offers an approximation of what this new Index will look like, but with enhanced, blended data.



The IHP Eligibility Index will also enable us to improve our IHP equity analyses.

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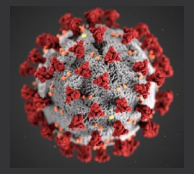
Case Study 2

COVID-19 Analysis and Response Operations

Background Information



- **First nationwide disaster declaration** in FEMA's history, with major disaster declarations in all 50 states, 5 territories, 3 tribes, and Washington DC
- **Longest activation of FEMA's National Response Coordination Center (NRCC)** in history
- Key lines of effort for FEMA included the role of Lead Federal Agency (LFA) of the federal pandemic response, SLTT emergency management operational support, Public Assistance and Individual Assistance grants management, supply chain stabilization, critical medical supply distribution, and vaccination assistance

Decision Support Needs

- **Where are federal resources most needed, and where are future needs anticipated?**
- **What federal resources have been requested, and can FEMA meet those requests?**
- **Where can FEMA stand up community vaccination sites** to best meet the nation's needs (e.g., serve underserved communities, facilitate access to sites)?

FEMA's Analytic Approach

- Continuously analyze data on cases, hospitalizations, vaccine supply, vaccination rates, etc.; **data primarily reported by SLTT governments to the U.S. Department of Health and Human Services (HHS), and managed by HHS**
- Conduct analyses within HHS's Tiberius data management and analysis system
- Track available resources (money, people, and commodities---both federal and donated) and match them to resource requests

Case Study 2 (continued)

COVID-19 Analysis and Response Operations

Challenge 1: Data Access and Integration Constraints

- **The HHS Tiberius data sharing platform took several months to set up** and did not contain all HHS data sets.
- **Extracting HHS data from Tiberius to blend with FEMA data was challenging** due to limitations of data sharing agreements.
- **FEMA staff could not independently ingest data into HHS Tiberius** or analyze blended FEMA/HHS data without Extract/Transform/Load (ETL) support from HHS staff.
- FEMA faced challenges accessing systems that states used to collect their own vaccination data. **Some states sent data to FEMA by email or physical storage media and sometimes only gave aggregated data.**
- **Analysis needed to be completed under very short timelines** due to President Biden's goal of administering 100 million vaccinations nationally within the first 100 days of his administration.

Challenge 2: Inconsistent Data Formats

- The **lack of data standardization** across regions, states, hospitals, distributers, and federal agencies made blending not feasible at the most granular level. This challenge persisted throughout the response.
- FEMA was receiving a massive number of resource requests and initially there was **no standard way of requesting resources or of describing resources that were available**; there was too much incoming data to cleanse it manually.
- **Blending data from numerous resource providers (federal agencies and private companies donating resources) and requestors (59 SLTTs) was difficult to impossible at first.**

Case Study 2 (continued)

COVID-19 Analysis and Response Operations

Solution: Build a Dashboard within the Constraints (Make it Work!)

Despite data access and integration challenges, FEMA conducted extensive, actionable analyses:

- FEMA staff built a dynamic dashboard that used multiple data sets, including American Community Survey (ACS) and Social Vulnerability Index (SVI) data, revealing areas of low vaccine access/vulnerability. The dashboard also:
  - Identified areas of high population and high vulnerability
  - Incorporated detailed geospatial data to identify potential physical locations to stand up community vaccination sites
  - Incorporated walkability and transportation information
- FEMA regions used the dashboard to support SLTT agencies in making determinations about where to locate vaccination sites.

Solution: Standardize and Blend Data for the Resource Provision Process

- We developed a standard set of reference data so that available resources and resource requests were defined consistently across the different data sources.
  - 2-level standard description of resource categories
  - 1 resource per request, with identification (ID) number, region ID, name, category, subcategory, quantity, status, description
  - Standardize resource request geographies
- We developed a resource allocation model that incorporated COVID-19 public health data (source: Johns Hopkins University data).
- We tied resource requests to related data such as logistics, transportation, and contracts.
- We aggregated all reported data to remove sensitivities.

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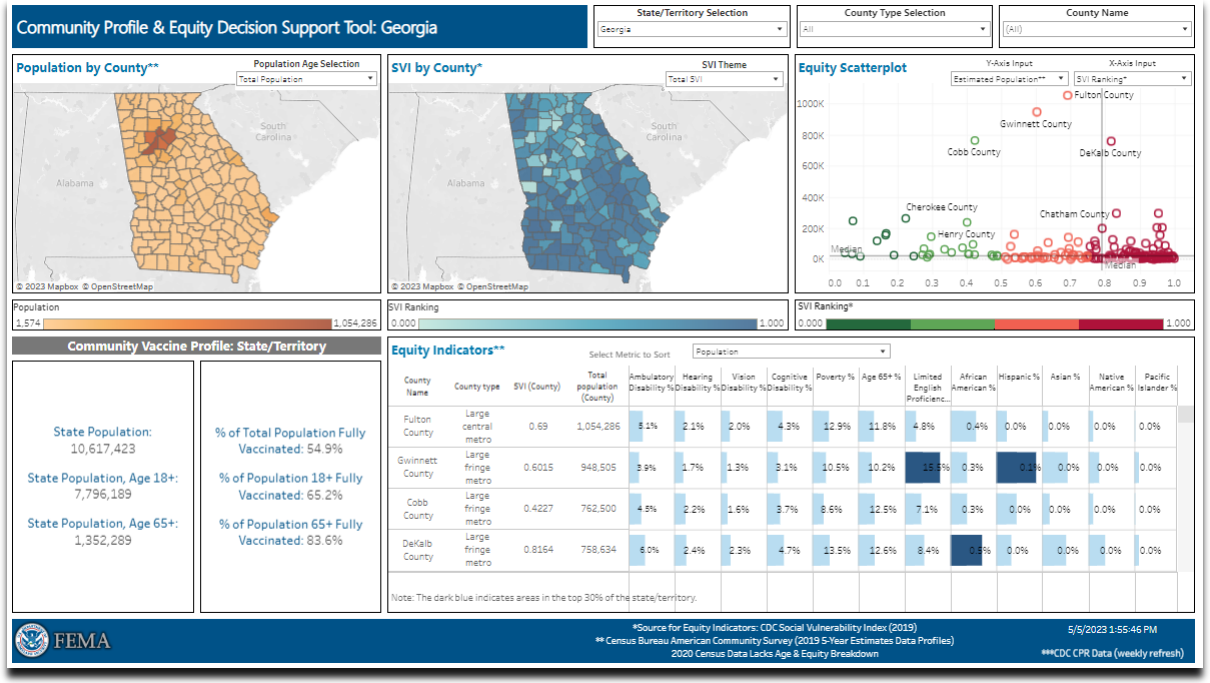
Case Study 2 (continued)

COVID-19 Analysis and Response Operations

Outputs that Illustrate our Blended Data Solutions



The Community Profile and Equity Decision Support Tool that FEMA used to help states determine sites for vaccine centers

RRF#	Region Id (groups)	Name	REF Resource Category	REF Resource Subcategory	Status	Resource Quantity Unfilled
2572-114161	NRCC	NRCC/DC	Personal Protective Equipment (PPE)	Personal Protective Equi..	Ordered	0
2572-122117	Region IX	California	Consumable Medical Supplies	Consumable Medical Suppli..	In Process	60,000
2572-128234-006	Tribal	Seminole Tribe of Florida	Personal Protective Equipment (PPE)	Goggles	In Process	28,000
2572-128380-003	Tribal	Seminole Tribe of Florida	Personal Protective Equipment (PPE)	Goggles	In Process	28,000
2572-289247	Region VI	New Mexico	Durable Medical Equipment	Mobile Treatment Equ..	In Process	4
2572-337067	Other Federal ..	DOE	Cleaning Supplies	Hand Sanitizer	Request Submitted	30
2572-337080	Other Federal ..	DOE	Cleaning Supplies	Hand Sanitizer	Request Submitted	30
2572-337116	Other Federal ..	DOE	Cleaning Supplies	Hand Sanitizer	Request Submitted	10
2572-337145	Other Federal ..	DOE	Cleaning Supplies	Hand Sanitizer	Request Submitted	10

A standard set of reference data allowed for significantly improved management of resource requests, even when we had to blend data—including sensitive data—on an unprecedented scale.

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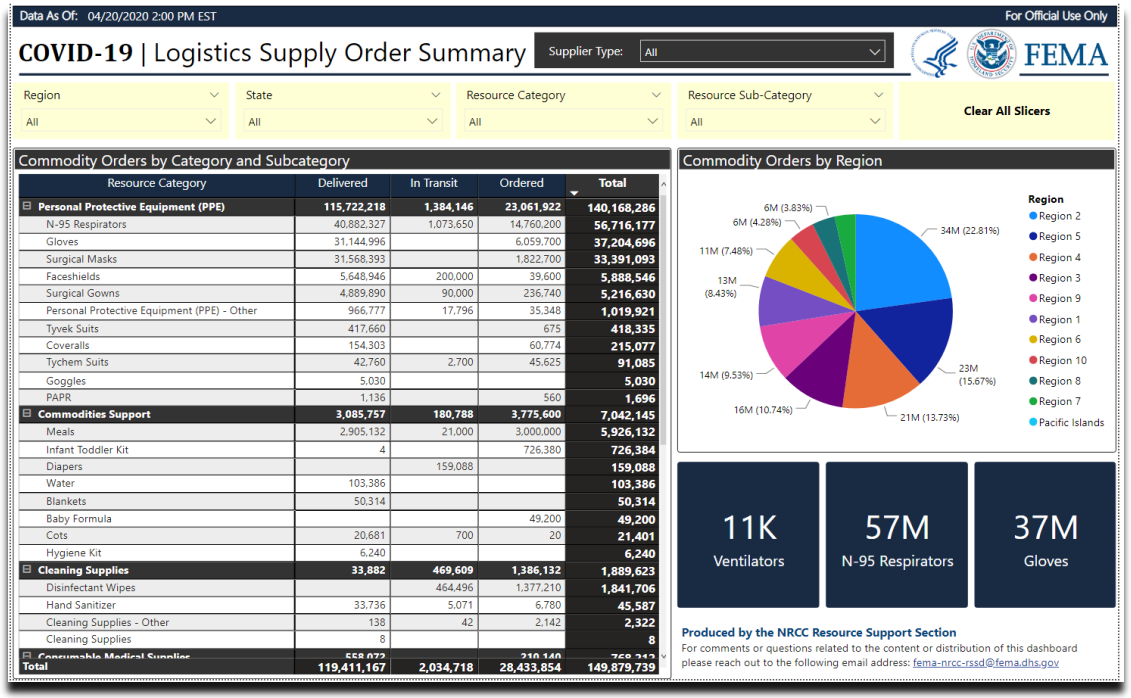
Case Study 2 (continued)

Accomplishments Supported by Analysis of Blended Data

- Over 7000 resource requests processed
- Over 200 million N95/KN95 respirators, 300 million gloves, 28,000 ventilators delivered
- Deployments of ~30,000 Federal personnel managed in response to 770 requests for personnel
- Awarded more than $100 billion in funding to SLTT governments, private non-profits (PNPs), and individuals
- 18 community vaccination centers established through coordination between the Federal government and state partners
- Ability to administer as many as 61,000 shots per day at full capacity
- Milestone of 100 million vaccinations was met 42 days ahead of the 100-day goal



Dashboard FEMA created to support resource provision management, which allowed the user to view the status of resource requests using the new standard

Lessons Learned From Recent Experiences

Privacy Considerations in Blending Disaster Data

Data Exchange

- There is limited system integration between FEMA, Other Federal Agencies, and SLTT systems. It needs to be easier to securely exchange data between these systems. No one should be emailing data or sending physical data storage devices.
- Partnerships such as the FEMA/U.S. Census Bureau partnership provide significant value but establishing them requires months of lead time and continuous coordination on data access controls.

Data Access

- There is a very high degree of awareness of and concern for the importance of protecting sensitive data among FEMA staff.
- PII concerns sometimes lead to an "all or nothing" model for direct access to data. Even where policy allows for sharing, systems do not always have the ability to support the granular access control requirements to implement what is permissible by policy.
- The concept of a single platform where staff can access, analyze, and visualize data is viewed favorably, but is challenging to execute.

Data Integration

- Establishment of standard reference data makes it much easier to integrate data from different sources. Free text data collection makes it much more difficult.
- Understanding what data from our partners is authoritative is an ongoing challenge.

Data Sharing

- Well-defined business processes are required for data dissemination: how data is provided to whom, who can approve, what labels/warnings go on what data products.
- Advanced notice and guidance or templates for SLTT partners on how to write requests for FEMA data has been effective in reducing protracted levels of effort in preparing those requests.

Actions We Are Taking Now: Policy

Privacy and Sharing Data with the Public

Critical Topic		Principles	Practices
	Survivors	• **The privacy of survivor's personal sensitive data is paramount. This is our top data principle.**	• FEMA is reviewing all data privacy and sharing directives to address identified gaps or inhibitors that might cause a delay during an emergency. • FEMA seeks to deliver data sooner **without compromising the privacy of survivor's personal sensitive data.**
	PII	• FEMA will minimize the creation, collection, usage, processing, storage, dissemination, or disclosure of PII that is directly relevant and necessary for a legally authorized purpose.	• FEMA is exploring enterprise-wide metadata management requirements, including requirements for privacy-related metadata. • FEMA will codify the responsibilities of FEMA personnel and outline the expectations of partners for the use and care of data, including PII.
	Data Sharing	• FEMA aims to responsibly share data by default to the fullest extent allowable under law, a principle at the core of the recently published FEMA Data Strategy.	• A request to share data with the public requires a Data Release Questionnaire (DRQ) and Privacy Threshold Analysis (PTA). • The DRQ and PTA require multiple FEMA approvals and a DHS Privacy Review before being approved.

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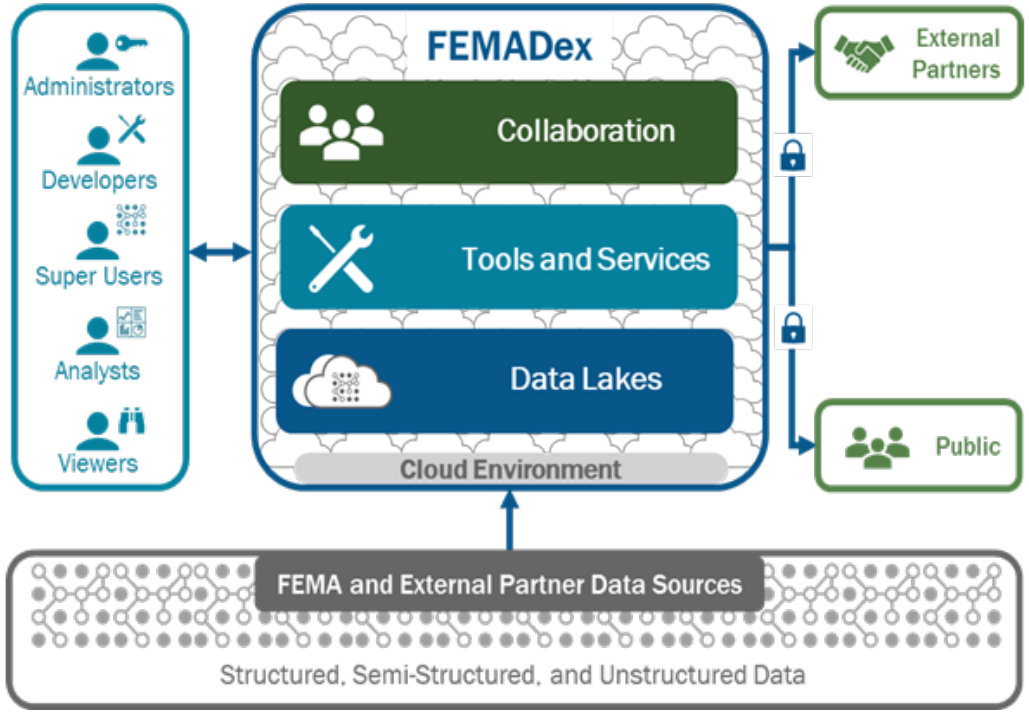
Actions We Are Taking Now: Technology

Developing the FEMA Data Exchange (FEMADex)



Discover, Access, and Gather Data

Ingest data from a variety of internal and external sources.

Integrate Data

Incorporate cross-cutting and disparate datasets.

Analyze Data

Examine the data to identify meaningful insights.

Disseminate Data

Share data and insights through reports and visualizations.

Secure Data

Maintain data integrity, security, and confidentiality.

FEMADex is a modern, cloud-based enterprise data platform that is being delivered through FEMA's Enterprise Data & Analytics Modernization Initiative.

Remaining Challenges and Recommendations

For FEMA and Our Partners

- Pursue a coordinated effort to facilitate data exchange across federal government agencies, keeping in mind:
  - Systems are old
  - Systems need to make data exchanges securely
- Continue to socialize consistent guidance on the process for FEMA's partners to request access to sensitive FEMA data, including the information needed to justify the request.
- Address tactical privacy policy questions and issues.
  - Clear and consistent processes
  - Guidance on sharing data in specific situations
  - Managing improper data handling

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