



# **Standards, Interoperability, and Software: the VHA Experience with Terminology Standardization in the Allergy Domain**

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# Definition

- Terminology Standardization is foundational to computable, interoperable data sharing across a health care information infrastructure
- Terminology Standardization refers to the identification, adoption, implementation, verification, maintenance and compliance monitoring of data standards



# The Goals of Standardization

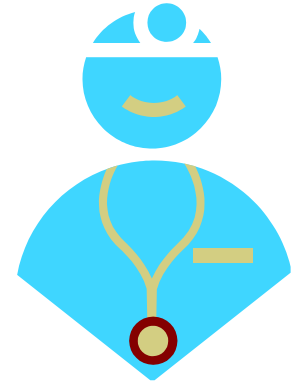
- Clinical decision support
- Ensure consistent interpretation of clinical information
- Support interoperability with health care partners
- Support public health and bio-surveillance activities
- ***Improve quality, safety, and cost-effectiveness of patient care***





# Multi-Disciplinary Domain Teams

- Analysts
- Project Manager
- Business Owners
- Subject Matter Experts
- Terminologists
- Developers
- Architects
- SDO representatives
- Implementation Coordinators
- Maintenance team





# Standardization Process

- **Analyze reference table data from sites**
- **Research existing standards**
- **Approve data standards**
- **Establish an implementation plan**
- **Create requirements documentation**
- **Develop the standardization software**



# Standardization Process (cont'd)

- **Complete testing**
- **Support implementation of data standards**
- **Support data clean-up activities**
  - Provide centralized mapping to standard terminology when necessary
- **Maintain the standards**
- **Monitor compliance**

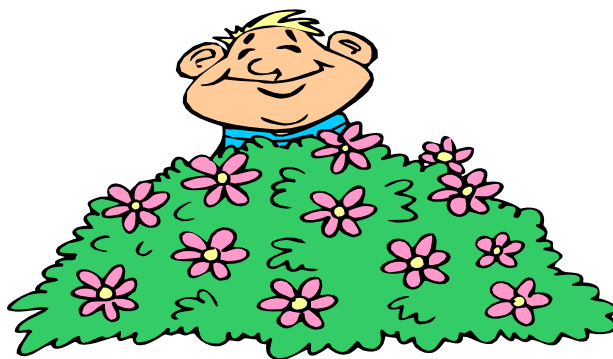


# Critical Domain Decisions

- What is the business need?
- What data needs to be standardized?
- If a standard is available which is most appropriate?
- How much data do we standardize: time forward and/or historical data?
- What is the impact on patient care & the legal health record?
- Is mapping needed? If so what type of mapping?
  - How much can we automate or do centrally?



# ALLERGIES DOMAIN







# Business Need for Allergy Standardization

- Health Information Exchange
  - Eliminate coding inconsistencies
  - Retain meaning of terms across systems
  - Share computable data
- Application of Decision Support
  - Improve Patient Safety
  - Implement Order checks for free text entries:
    - Drug/Allergy
    - Drug Ingredient
    - Drug Class



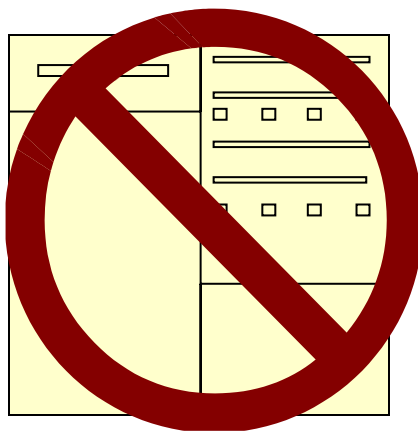
# Allergy Domain Plan

CONTENT OR DOMAIN	STANDARDIZATION APPROACH	STANDARD	MAPPING	WORK DONE
Allergy	All data	VA standard	Free text conversion to standard	Centrally and Automated by Software



# Prior to automated free text clean-up:

**1,000,000 free text allergies =**



**Not computable**



# Establish Standards

VA, Coded, Interoperable, Computable terms from the following files:

- GENERIC DRUG (VA NDF)
- DRUG CLASS (VA NDF)
- DRUG INGREDIENTS (VA NDF)
- ALLERGY REACTANT



# Decision Support Impact

<b>Drug Allergy Native Decision Support</b>	<b>Standard Files</b>
Drug Class Order Check	ALLERGY REACTANT, GENERIC DRUG & DRUG CLASS
Drug Ingredient Order Check	ALLERGY REACTANT, GENERIC DRUG & DRUG INGREDIENT



# Software Requirements

- Mapping file to convert free text to coded terms
- “No Known Allergies”
- Appending the words “Free text” for entries not mapped
- Add Comment to the allergy record indicating the change to the record



# Mapping File Sample

FREE TEXT REACTANT	CODED NAME
PCN	Penicillin
Sulfa drugs	Sulfa Drugs
Ace Inhibitor Meds	ACE INHIBITORS
ETHANOL	ALCOHOL, ETHYL
MONDAYS	
NKA	NKDA



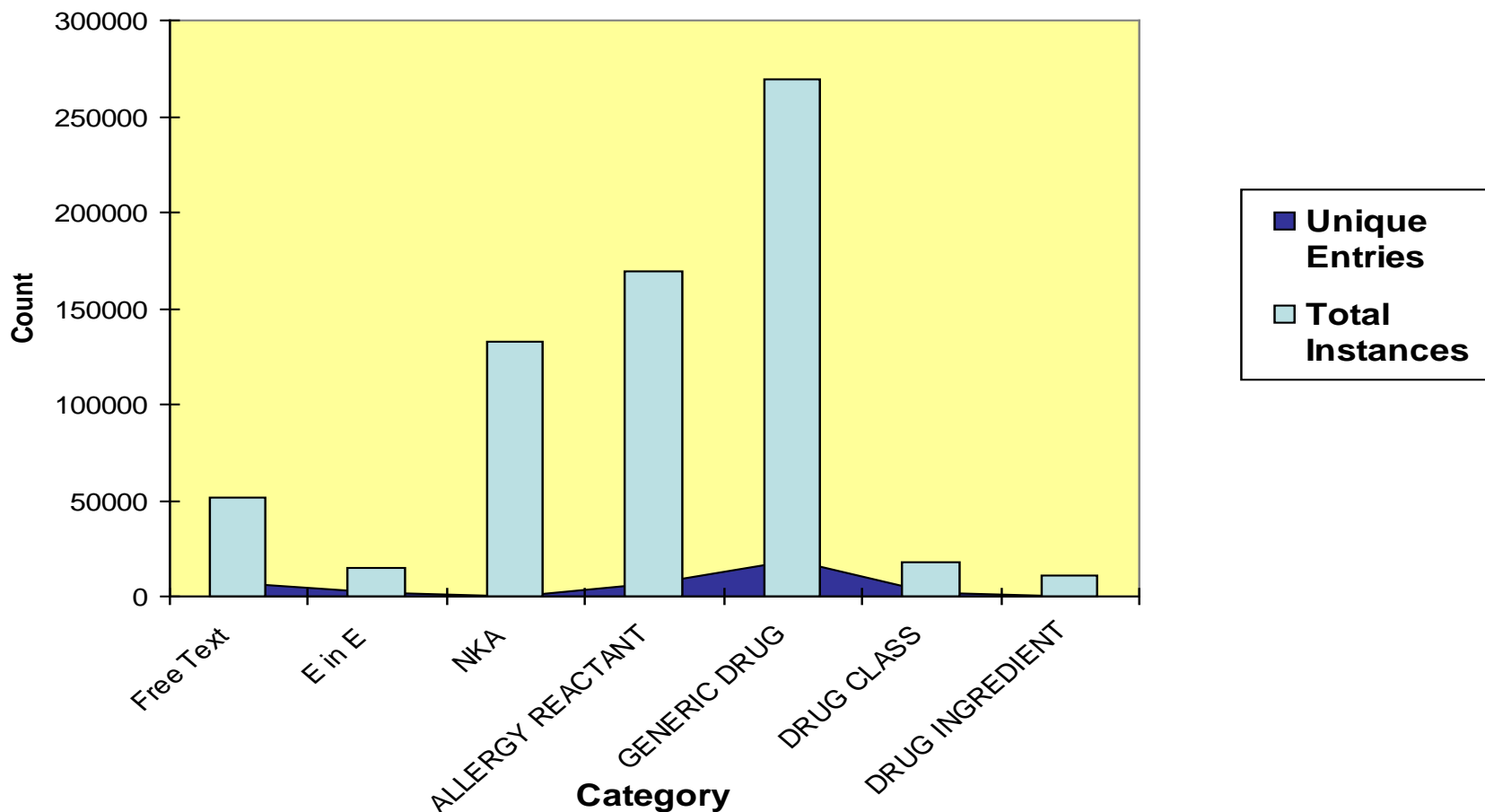
# Sample of Mapping Variations

Mapping	Count of Unique Variations	Total Instances
Penicillin	1264	102292
Sulfa	904	48073
Aspirin	378	9974
Morphine	306	4278
Tuberculin, PPD	302	3161
Codeine	293	16695
Nitroglycerin	284	1599
Erythromycin	244	2484
Lisinopril	218	1131
Influenza	170	4357
Ibuprofen	165	3269
Nifedipine	162	903





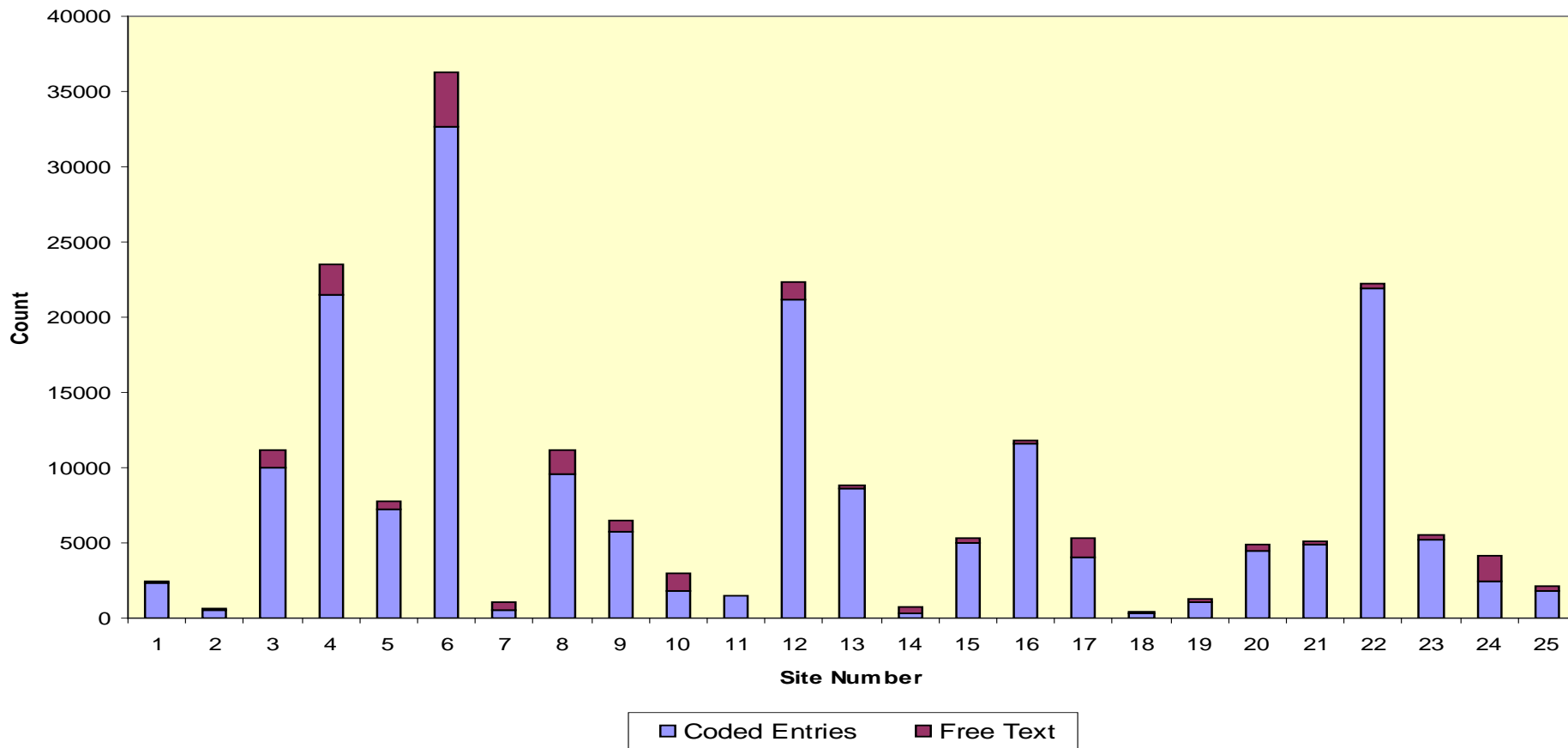
# Unique Entries and Total Instances Compare





# Results from Sites 1 - 25

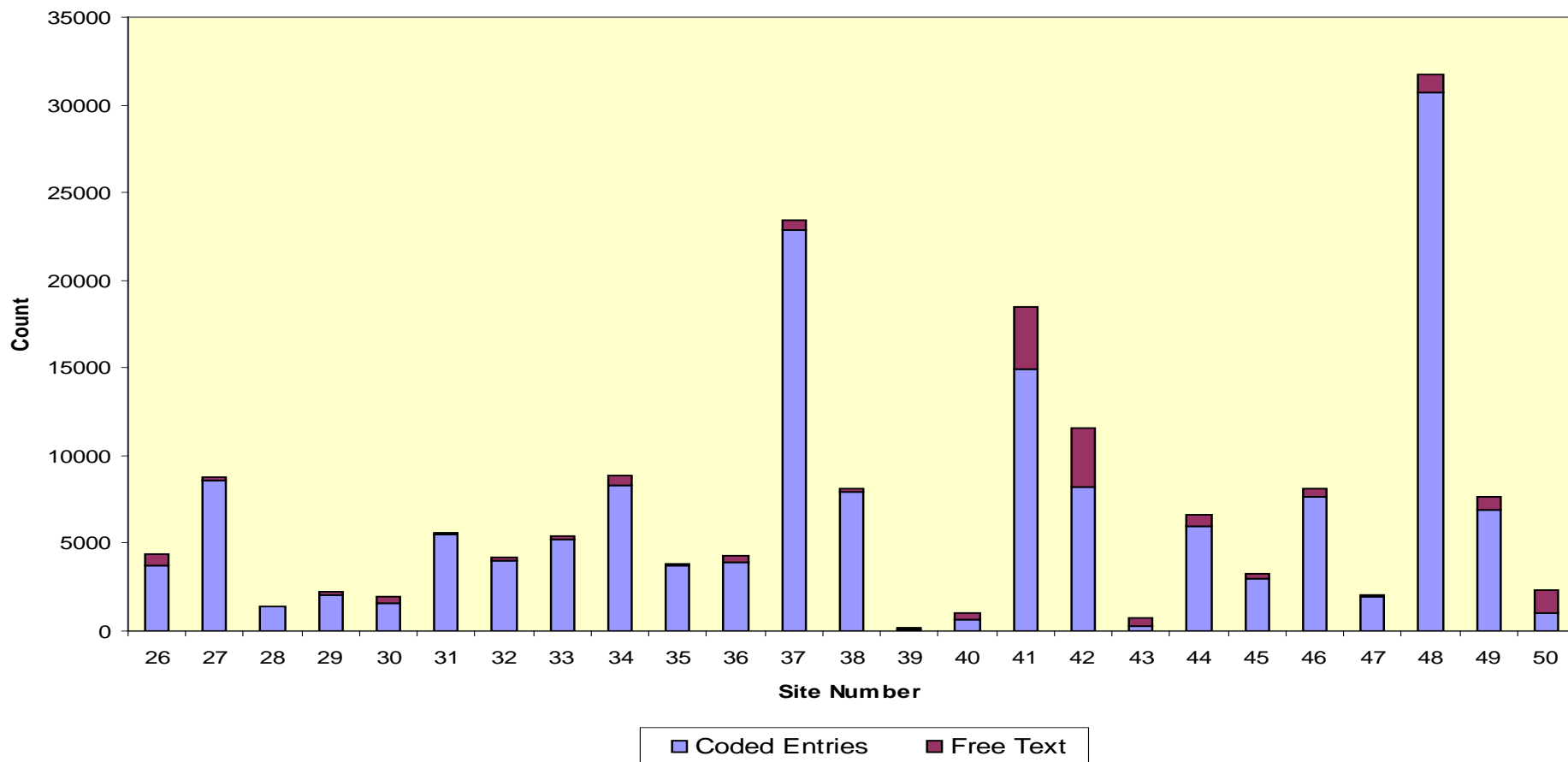
Sites 1 - 25 Results





# Results from Sites 26 - 50

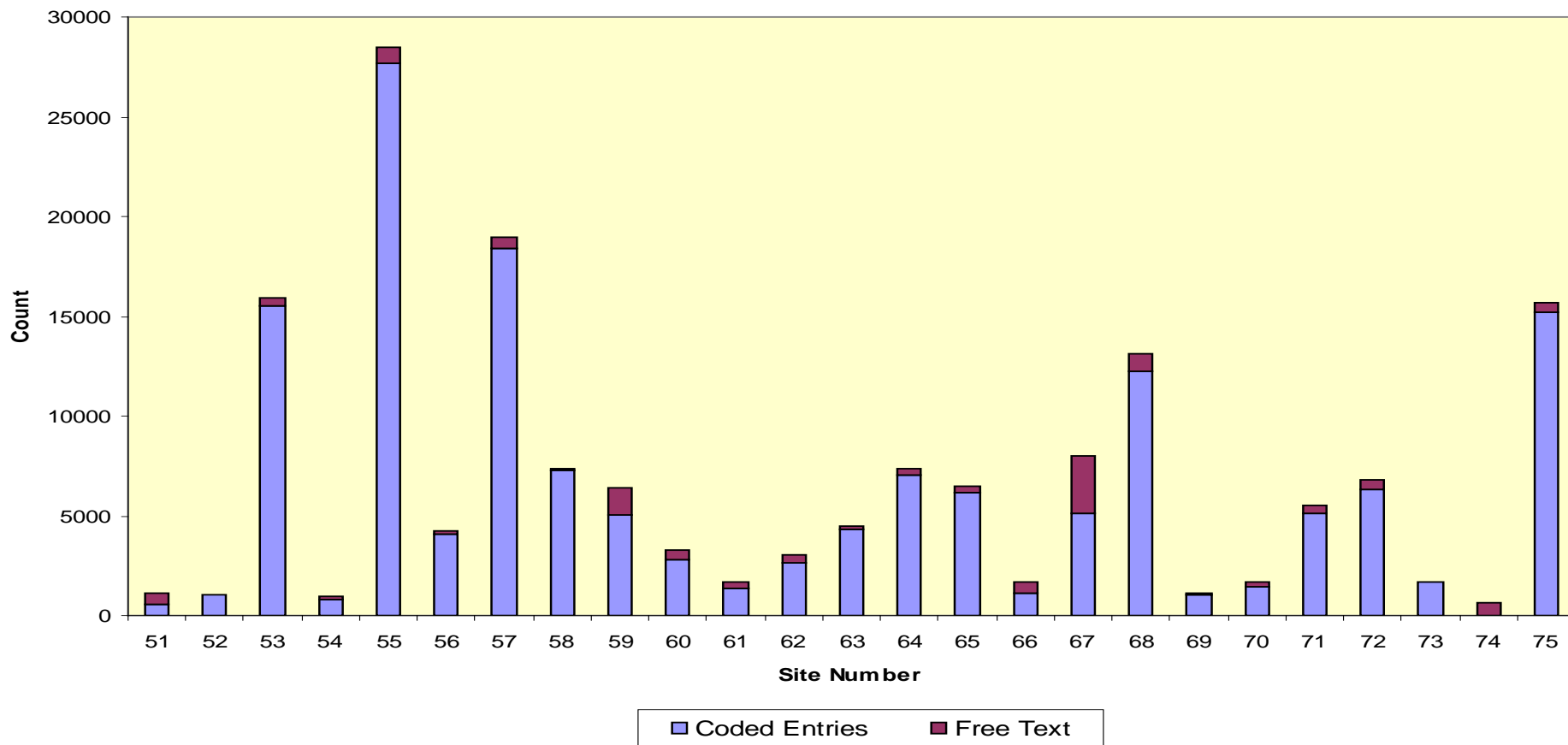
Sites 26 - 50 Results





# Results from Sites 51 - 75

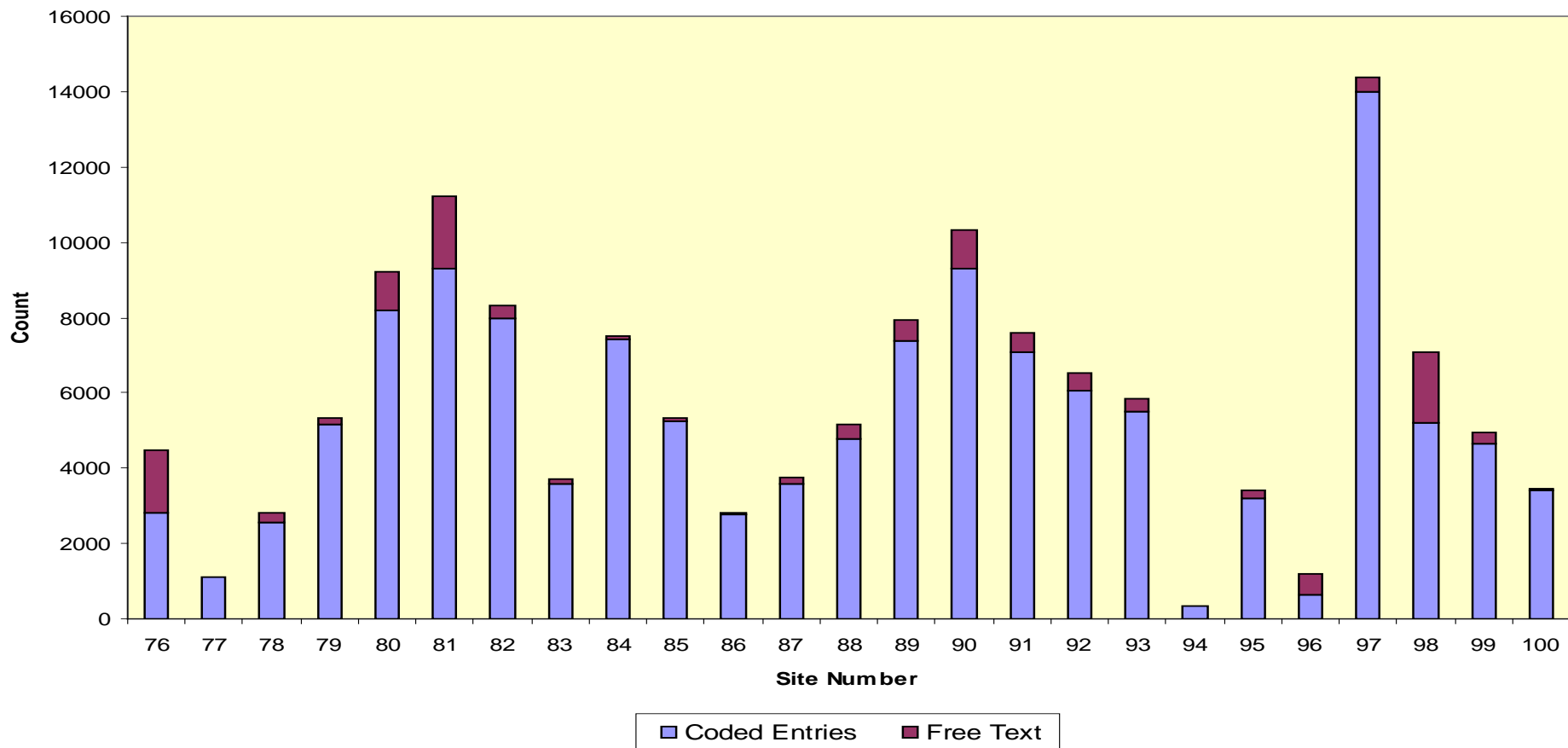
Sites 51 - 75 Results





# Results from Sites 76 - 100

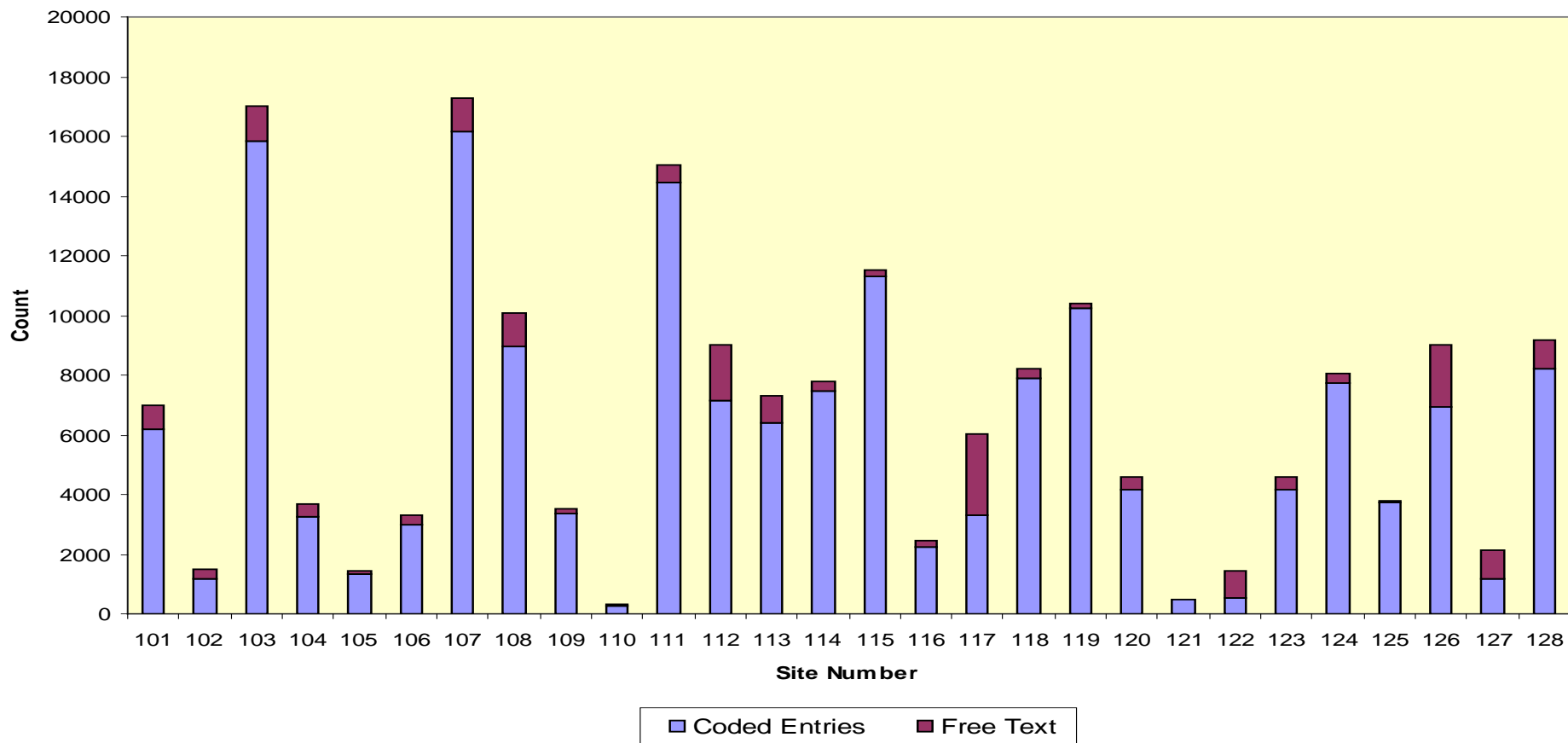
Sites 76 - 100 Results





# Results from Sites 101 - 128

Sites 101 - 128 Results



# Noteworthy Stats

- Sites cleaned up 81% of the original free text entries (612,282 out of 750,000)
- Over 900,000 entries were converted to free text by converting inactive standard entries to free text
- Overall 81% of final free text count were converted to coded allergies



# Allergy Domain Challenges

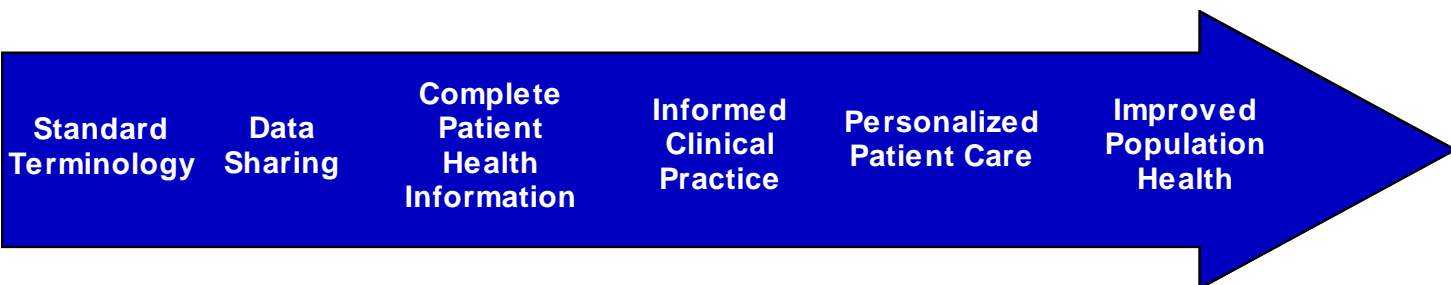
- Free text entries
- HIM approval
- Business Rules
- Internal Verification & Validation
- Correctness of the mappings
- Preferred mappings for optimal decision support
- Specificity of mappings
- Scope increase
- Project timeline





# Conclusion

- Significant benefits from standardization include:
  - Enhanced decision support across sites
  - Increased Interoperability across systems
  - Increased patient safety
  - Increased quality of care
  - Increased information for clinicians





# Contacts

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