IIS JOINT DEVELOPMENT AND IMPLEMENTATION

Address Cleansing and Geocoding Project

AMERICAN IMMUNIZATION REGISTRY ASSOCIATION
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Executive Summary

In 2014, AIRA was awarded funds through a Cooperative Agreement for Enhanced Standards Support for the Immunization Information System (IIS) Community. The Cooperative Agreement provides support for the creation of a governance structure to facilitate and guide IIS joint development efforts. AIRA has convened a Joint Development and Implementation Advisory Workgroup (Advisory Workgroup) to oversee and advise this process, including the launch of an initial joint effort.

Members of the Advisory Workgroup decided on a centralized address cleansing and geocoding service as the initial joint development concept project due to its ability to impact a variety of data quality and assessment activities. The scope of this project included identifying address cleansing/geocoding solutions that have already been implemented/investigated by the IIS community, identifying challenges or barriers that should be considered in the selection of a centralized solution, recommending an address cleansing/geocoding solution and service provider(s) that should be pursued by AIRA, and identifying both programmatic and technical considerations for implementation of the recommended solution(s). Information for this project was gathered using a variety of methods including a polling of the AIRA membership, interviews with selected IIS projects, and market research.

From the interviews and polling results, two distinct models emerged for how address cleansing is currently being performed in the IIS community – address standardization and address updates.

1) Address Standardization/Verification – addresses are standardized, normalized, verified and reformatted to align with the USPS database and national address specifications. This method is strictly address driven and does not utilize any patient identifying information.
2) Address Updates – identification of patients that have temporarily or permanently relocated to a new address. This method is patient driven and leverages unique patient information to identify an address change.

From the interviews and polling results, there were also two primary mechanisms for achieving geocoded addresses – 1) geocoding in conjunction with address standardization and 2) geocoding using standalone software for batch geocoding of data at rest.

The Advisory Workgroup assessed the pros and cons of the two address cleansing and two geocoding models, as well as the barriers and concerns reported from the membership outreach poll. Based on the available information, a service for address standardization with simultaneous geocoding was determined to be the most viable option for achieving a shared service offering facilitated through AIRA. Address standardization/verification with geocoding was selected as the preferred solution for several reasons:

- Address standardization is an important precursor to any efforts pursued toward address updates as a future phase.
- Services provide standardized address formats, validation that the address exists within the USPS database, and geocoding for additional support during IIS coverage assessment activities.
- The address standardization model supports unlimited use and enterprise licensing/pricing that would lend itself well to a community-wide shared service offering.

- Address standardization services provide the flexibility for both real-time, web service calls for inbound address data and batch processing for data at rest (Note: batch processing will be primary focus initially due to minimal IIS development requirements and the potential to show immediate success and data quality improvement).
- The solution does not require transmission of patient identifying information that was a noted barrier/concern for some IIS jurisdictions.
- IIS system development requirements and effect on IIS processing/performance should be minimal.
- Quantifiable evaluation metrics on the impact of the address standardization service will be readily available.

In order to implement the selected address standardization/verification and geocoding service, AIRA and the Advisory Workgroup will proceed with selection of a service provider, establish the appropriate infrastructure to administer the project, develop appropriate evaluation mechanisms and metrics to measure impact/outcomes, and initiate a pilot implementation with selected IIS. Ultimately, an Implementation Guide will be developed for community-wide rollout detailing participation requirements, specifications for connecting with the new service, and best practices/lessons learned documented during the project's pilot phase.

The following document further describes the process used to collect information for this project, findings from the membership outreach and IIS interview efforts, service selection considerations, and next step recommendations. For more information on the project or to volunteer as a pilot project, contact Maureen Neary at 202.552.5761 or mneary@immregistries.org.

Introduction/Background

AIRA has been a conduit for convening the IIS community, crafting standards, and creating pathways for the flow of information between and among IIS since its inception. With over a decade of success, these efforts have established a network of efficiency and trust across the IIS community. It is through this network that joint and collaborative development efforts can be created and tested.

Core functionality between systems increasingly overlaps, but some IIS use unique, stand-alone architecture. For these systems, enhancements and development must be coded and funded separately for each unique system. Joint and collaborative development has the potential to offer a new method for supporting IIS functions and enhancements in a more cost-effective, sustainable way. Creation and support of modular components in the public domain or open source market could offer an opportunity for IIS to adopt new functions, developed using standard methods and best-practice design, for a proportion of the cost needed to develop them independently.

In 2014, AIRA was awarded funds through a Cooperative Agreement for Enhanced Standards Support for the Immunization Information System (IIS) Community. The Cooperative Agreement provides support for the creation of a governance structure to facilitate and guide IIS joint development efforts. AIRA has convened a Joint Development and Implementation Advisory Workgroup (Advisory Workgroup) composed of broad representation from immunization programs, IIS programs, and IIS vendors to oversee and advise this process, including the launch of an initial joint effort.

Members of the Advisory Workgroup assembled for an in person meeting in the fall of 2015 to identify and select an initial joint development concept project. A centralized address cleansing and geocoding service was selected from three candidate projects due to its ability to impact a variety of data quality and assessment activities.

As IIS data is increasingly used to support a number of immunization program activities (e.g. AFIX, National Immunization Survey (NIS), reminder/recall), the quality of IIS data is becoming a high-level priority. Patient address is one of the primary elements affecting data quality for these efforts. As such, an external address cleansing/geocoding service that can be leveraged by all IIS would improve data quality, benefit IIS operations, and provide support for all of the immunization program activities that rely on IIS address data.

This intervention will seek to address both incoming (data in transit) and existing data (data at rest). Three key components will be investigated:

- Address cleansing (correcting or completing address data in accordance with USPS standards)
- Address updating (adding forwarding addresses per USPS)
- Geocoding

The scope of this project includes identifying address cleansing/geocoding solutions that have already been implemented/investigated by the IIS community, identifying challenges or barriers that should be considered in the selection of a centralized solution, recommending an address cleansing/geocoding

solution and service provider(s) that should be pursued by AIRA, and identifying both programmatic and technical considerations for implementation of the recommended solution(s).

Methods

Information for this project was gathered using a variety of methods including outreach to the AIRA membership, interviews with selected IIS projects, and market research. This section describes these methods and processes.

A simple poll was developed using a web-based tool. The polling link and an invitation to participate were sent to all AIRA members associated with a CDC immunization awardee project/jurisdiction (64 awardees). The purpose of the membership outreach was to identify IIS projects currently conducting address cleansing and/or geocoding activities and the general nature of those activities. For projects not currently performing address cleansing or geocoding, the poll assessed attitudes and barriers to implementation of these services.

Initially 51 member responses were received. Twelve (12) were deleted as invalid or incomplete. An additional 7 were deleted due to >1 response per awardee. As a result, 32 unique awardee responses were used for the analysis.

From the member responses, 6 projects were selected for a more in-depth telephone interview regarding their address cleansing and/or geocoding activities. Response data was sorted to identify members that answered "yes" to either of the following questions:

- Does your IIS or your jurisdiction currently perform address cleansing functions?
- Does your IIS or your jurisdiction currently perform geocoding functions?

These responses were further filtered to eliminate respondents that indicated that they were not willing to be interviewed at this time. The following projects were ultimately selected for an interview:

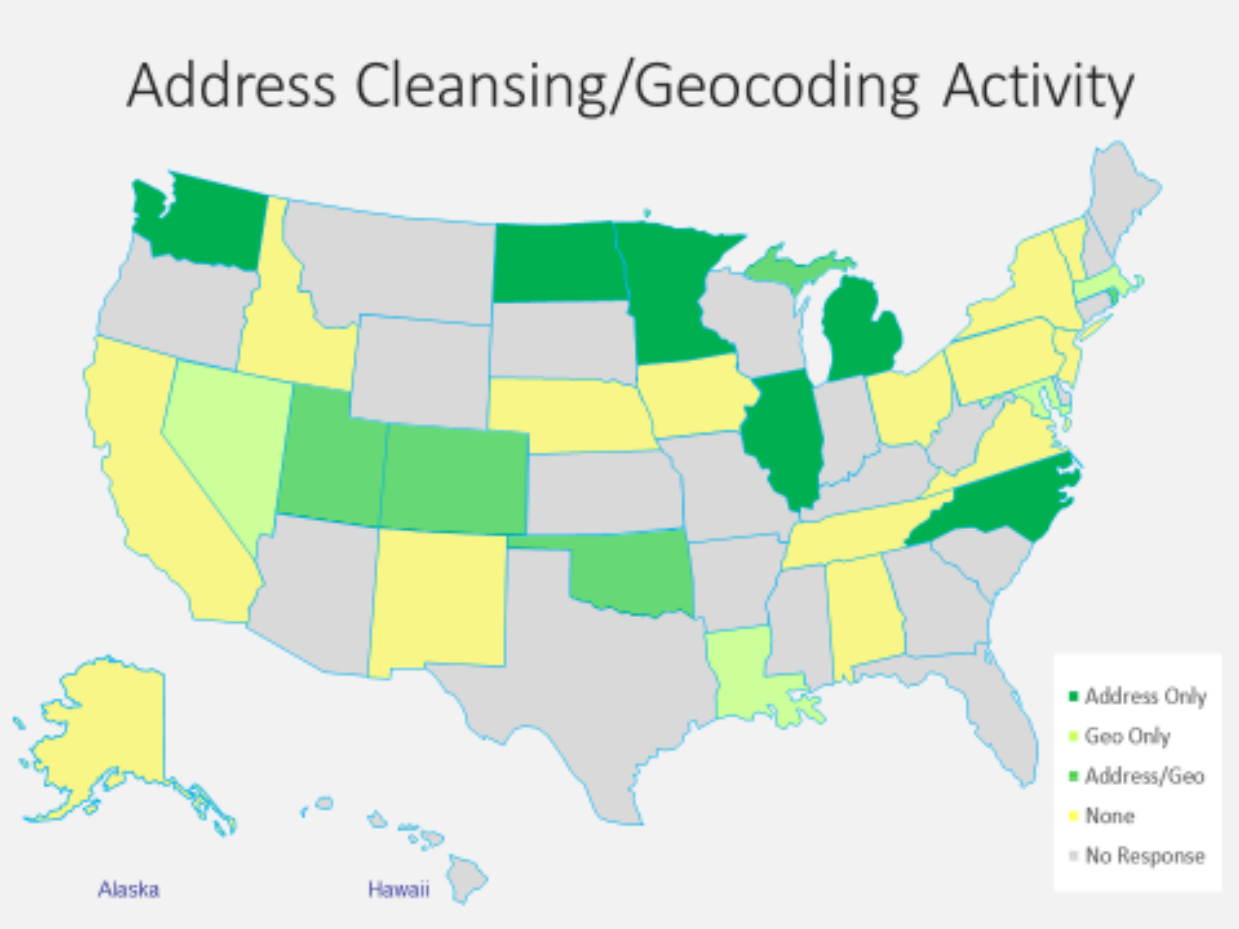
- Colorado (Address Cleansing and Geocoding)
- Michigan (Address Cleansing and Geocoding)
- Minnesota (Address Cleansing and Geocoding)
- Oklahoma (Address Cleansing and Geocoding)
- North Dakota (Address Cleansing)
- Washington (Address Cleansing)

The interview guide questions were developed in collaboration with the Address Cleansing Working Group, a subcommittee of the larger Advisory Workgroup. Participant interview responses were documented and then submitted back to the individual participants for review and approval.

Results from the membership outreach poll and interviews were assessed and presented to the Advisory Workgroup (see Findings). The Address Cleansing Working Group was then convened separately to discuss the possible solutions that AIRA could pursue to stand up an address cleansing/geocoding service for the IIS community. A summary of these discussions was then presented to the larger Advisory Workgroup for approval of the recommended solution (see Conclusion and Recommendation).

Findings

As previously stated in the Methods section, thirty-two (32) member responses were used in the initial analysis. Eleven (11) projects reported that they were currently performing address cleansing activities. Eleven (11) projects also reported that they were currently performing geocoding activities. Six (6) projects reported that they were doing both address cleansing and geocoding. The following map provides an overview of which projects participated in the outreach poll, and which projects are performing address cleansing and/or geocoding within their IIS. In addition to those displayed in the map, Puerto Rico is also performing address cleansing, and New York City is leveraging geocoding. It was also later reported that Hawaii is performing both address cleansing and geocoding, and Wisconsin is geocoding IIS addresses.



From the member responses, the following projects participated in a more in-depth telephone interview:

- Colorado (Address Cleansing and Geocoding)
- Michigan (Address Cleansing and Geocoding)
- Minnesota (Address Cleansing and Geocoding)
- Oklahoma (Address Cleansing and Geocoding)
- North Dakota (Address Cleansing)
- Washington (Address Cleansing)

The following sections provide a narrative summary of these interview discussions and online poll results.

Address Cleansing

From the interviews and polling results, two distinct models emerged for how address cleansing is being performed in the IIS community – address standardization and address updates.

3) Address Standardization/Verification – addresses are standardized, normalized, verified and reformatted to align with the USPS database and national address specifications. This method is strictly address driven and does not utilize any patient identifying information.
4) Address Updates – identification of patients that have temporarily or permanently relocated to a new address. This method is patient driven and leverages unique patient information to identify an address change.

Address Standardization/Verification

With address standardization, all inbound addresses, whether entered through the user interface or submitted electronically, are processed through the address cleansing service tool by using a web service call. The tool then assesses the various address components by parsing, normalizing, standardizing and verifying the address according to the USPS database and national address formatting specifications. The resulting address is then typically geocoded as part of this same procedure before populating the appropriate address fields in the IIS. This process occurs in real time and provides immediate results. As part of the initial implementation, all addresses can be processed through the tool using a batch procedure to ensure clean baseline data throughout the database.

Examples of address standardization tools/services include SmartyStreets (OK), SAP (MI), and MelissaData (suggested via member outreach). Colorado has developed custom code for their IIS that performs some of these address scrubbing and normalization functions. Commercial services typically employ a subscription-based service charge that allows for unlimited use of the service through an enterprise service agreement.

The following pros and cons of address standardization services/processes were expressed during the interview discussions:

PROS

- Processing occurs in real time as the address is coming in to the IIS by using a web service call – results in minimal to no impact on IIS performance/processing speed.
- Address format is correct and standardized in accordance with USPS specifications.
- Prohibits a correct address from being overwritten by an uncorrected inbound entry or submission - address syntax (city, state, zip, county agreement) remains intact at all times.
- Assists with patient matching when address is used as part of the match procedure.
- Results in accurate geocoding.
- Results in more accurate coverage assessments when run by various geographic parameters.
- Ability to leverage enterprise licensing across numerous programs/jurisdictions.

CONS

- Requires some development in the IIS to initiate the service call.
- Does not include any verification that the address is a valid address for the specified patient.

Address Updates

Address updates encompass a variety of methods used to identify an address or an address change for a specific patient or within a specified patient cohort. IIS are typically employing these services in conjunction with large scale mailing activities. The following provides a description of the four primary methods that IIS are using to accomplish address updates:

Contracted Service Provider - IIS projects submit a list or electronic file of specific patients and relevant demographic details to a third-party service. The service then runs searches against available resources (e.g. credit reports, drivers licensing, National Change of Address (NCOA), utility bills) to identify possible address updates. A file is then provided back to the IIS with possible address updates and, depending on the service provider, date that the address was last reported. The IIS then updates addresses accordingly. Examples: Thompson Reuters-Westlaw (MN), Anchor Computer (ND).

Patient Locator Software – Similar to a Contracted Service Provider except that the software is directly accessible to the user. Typically the IIS generates a cohort file, the file is loaded into the software, the software performs the respective search, and results are returned in a file for review by IIS staff. Selected results can then be uploaded to the IIS or manually updated by IIS staff. Example: Lexus Nexus (MI).

USPS Address Updates – IIS staff pull down a daily file from a USPS secure server that includes all address changes in the state that took place since the last update (e.g. 24 hours). This file includes all USPS forwards, holds and returns. The file is then uploaded into the IIS to identify possible matches and update addresses for routine mailing efforts. Example: USPS-Address Correction Service (WA).

Mailrooms (in house)/Mail House Vendors – IIS projects submit a set of patients and addresses to their mailroom/mail house for a targeted mailing activity. The mailroom/mail house will then leverage available tools to identify any incorrect addresses. These tools may include USPS changes (forwards and holds) and/or additional address scrubbing (address standardization/verification). These addresses are then cleaned up for the specified mailing, and a document or electronic file containing the updated

addresses is provided back to the IIS for manual review and system updates. Mailrooms will also provide the IIS program with any returned mail so that addresses can be manually updated. Examples: In-house (OK), Lacy and Par (WA), Pre-Sort Plus (ND), LOB.com (suggested).

Address update services typically employ a cost per record charge or a tiered pricing model (e.g. $75 for up to 1,000 records). Cost per record models typically do not have a minimum or maximum charge.

The following pros and cons of address update services/processes were expressed during the interview discussions:

PROS

- Results in good addresses for the specified cohort(s).
- Minimizes cost of returned mail on large mailing efforts.
- Review occurs outside of the IIS, so there is minimal/no impact on IIS performance/processing speed.

CONS

- Efforts are typically limited to a specific cohort and/or specific mailing effort vs. the entire database (push models). Efforts are limited to a specific state/jurisdiction (pull models).
- Can easily become cost prohibitive with cost per record pricing.
- Requires the transmission of patient identifiers.
- Addresses are not always accurate because they are associated with the responsible party versus the minor child. As a result, the IIS sometimes ends up with addresses for relatives of the patient instead of the intended individual.
- An address update received through the service may actually be outdated or less specific than what already exists in the IIS.
- An old or less accurate address can potentially overwrite an address that has already been updated, cleansed or verified.
- This process requires a fair amount of manual effort on the part of IIS staff to pull files, review possible updates, and then perform desired updates.
- Depending on which solution an IIS is using for updating addresses, some development to the IIS may be required to either generate or accept a file from the service being used.
- Address standardization, verification, and geocoding is not typically included in address update type services.

Poll Results – Address Cleansing

As noted previously, eleven (11) projects reported that they were currently performing some sort of address cleansing activities. Of those, seven (7) are leveraging USPS data in one form or another. Four (4) projects reported having developed custom code in their IIS to manage address standardization/normalization. Only two (2) projects are sharing their service with other programs in their jurisdiction (Oklahoma and Michigan – see above).

For jurisdictions that are not currently performing address cleansing, nine (9) reported that they have actively explored options to implement an address cleansing tool or service. A list of common barriers to implementing were provided, and respondents were asked to what extent these barriers have affected their ability to implement address cleansing activities. The barriers to implementing were ranked (and weighted, 5 point scale) as follows:

1. Lack of time to develop or implement (3.90)
2. Cost of services/applications (3.62)
3. Lack of operational resources to maintain service or process (3.60)
4. Concerns about impact to performance or processing time (3.33)
5. Policy issues with sharing data with other external entity (3.14)
6. Lack of technical resources to implement service (3.10)
7. Policy issues with sharing data with USPS (2.95)
8. Don't recognize the value (2.20)

Geocoding

Geocoding is the process of defining a specific physical location on Earth's surface through the assignment of precise coordinates (latitude/longitude). Based on these coordinates, other relevant information about the location can be obtained and/or verified. While various aspects of an area may change over time (e.g. defining boundaries, redistricting, acquisitions), the physical location of the place will always remain the same.

Interview participants were predominantly using geocoding for assessment activities, specifically coverage rates, as it related to various geo-political jurisdictions. Latitude/longitude, county and congressional district were the primary fields of interest for the interview participants. Geocoding was deemed particularly useful for synchronizing the city, state, zip, and county agreement.

There are two (2) primary mechanisms for achieving geocoded addresses – geocoding at the point of address standardization and standalone software for geocoding data at rest.

Geocoding with Address Standardization

When geocoding is included as part of the address standardization service, the address is geocoded at the same point that the standardization/normalization occurs. A single web service call results in a seamless transaction of standardization and geocoding before the address is recorded in the IIS. Examples include SmartyStreets (OK), SAP (MI) and MelissaData (suggested via member outreach).

PROS

- Occurs in real time as address is coming in by using a web service call. Minimal/no impact on IIS performance/processing speed.
- Results in more accurate coverage assessments when run by various geographic parameters.
- Ability to leverage enterprise licensing across numerous programs/jurisdictions.

CONS

- Requires some development in the IIS to initiate the service call.

Geocoding Software

When geocoding software is used, standalone software resides outside of the IIS and geocodes either at the point the address is introduced or is run periodically against the database. This process is completely independent of any other address management activities. Examples include Dataflux - SAS tool (MN) and Centrus (CO).

PROS

- Results in more accurate coverage assessments when run by various geographic parameters.

CONS

- Does not occur in conjunction with address cleansing activities.
- Depending on system configuration, may require a manual trigger to run the program.
- Licensing is typically limited to a single program.
- Requires software updates that may result in additional cost.

Poll Results – Geocoding

As noted previously, eleven (11) projects reported that they were currently performing some sort of geocoding activities. Three (3) projects reported that their solution was developed in-house. For jurisdictions that are not currently performing geocoding, ten (10) reported that they have actively explored options to implement a geocoding tool or service. Some of the geocoding services that have been explored by member respondents included:

- ESRI (NavTeq, ArcGIS, ArcIMS, ArcMap, cloud-based service)
- Microsoft and Google services
- MapMarker
- USPS geocoding tool
- eMPI

A list of common barriers to implementing were provided, and respondents were asked to what extent these barriers have affected their ability to implement geocoding activities. The barriers to implementing were ranked (and weighted, 5 point scale) as follows:

1. Competing priorities (4.38)
2. Lack of operational resources to maintain service or process (3.65)
3. Cost of services/applications (3.57)
4. Lack of technical resources to implement service (3.14)
5. Concerns about performance or processing time (2.81)
6. Policy issues with sharing data with USPS or other external entity (2.48)
7. Don’t recognize the value (2.00)

MPI: Address Cleansing and Geocoding

The membership outreach poll also investigated the relationship of IIS addresses and the state/jurisdictional MPI. Only two projects reported that they were sharing IIS addresses with the MPI, and only one of these updates addresses in the IIS with addresses from the MPI. In addition, three projects reported that an IIS-MPI linkage was currently in progress.

Two of the projects "in progress" included Michigan and Oklahoma. Both of these projects intend to leverage their address cleansing/geocoding solutions in conjunction with the MPI. Ultimately all addresses in the MPI, and other state systems participating in the MPI, will have been processed through the address/geocoding service tool to ensure that all addresses have been validated and conform to national address formatting specifications.

Conclusion and Recommendation

The primary objective of this project is to establish a centralized address cleansing and geocoding service that can be leveraged by the IIS community to improve data quality and accuracy of geographically-based coverage assessments. Results from the membership outreach poll and in-depth interviews provided a valuable snapshot of activities currently being conducted to support quality address data in IIS.

Based on the available information, a service for address standardization with simultaneous geocoding was determined by the Advisory Workgroup to be the most viable option for achieving a shared service facilitated through AIRA. The Advisory Workgroup reserved the option to further investigate and consider implementation of an address update service as a future phase of the project. Address standardization/verification with geocoding was selected as the preferred initial solution for several reasons:

- Address standardization is an important precursor to any efforts pursued toward address updates as a future phase.
- Services provide standardized address formats, validation that the address exists within the USPS database, and geocoding for additional support during IIS coverage assessment activities.
- The address standardization model supports unlimited use and enterprise licensing/pricing that would lend itself well to a community-wide shared service offering.
- Address standardization services provide the flexibility for both real-time, web service calls for inbound address data and batch processing for data at rest.
- The solution does not require transmission of patient identifying information that was a noted barrier/concern for some IIS jurisdictions.
- IIS system development requirements and effect on IIS processing/performance should be minimal.
- Quantifiable evaluation metrics on the impact of the address standardization service will be readily available.

As an implementation consideration, the Advisory Workgroup further recommended that the initial effort should be focused on offering a batch processing option to interested IIS. Batch processing could be rapidly implemented with little or no IIS development requirements and the potential to show immediate success and data quality improvement. Further, batch processing does not pose the potential performance risks that may be introduced with real-time processing. Real-time, web service integration would, however, still be available as an alternative option to those IIS interested in pursuing this more advanced level of processing.

The recommendations of the Advisory Workgroup will be submitted for approval by the AIRA Board. Once approval has been received, the Advisory Workgroup can proceed with implementation. In order to implement an address standardization/verification and geocoding service, AIRA and the Advisory Workgroup will need to identify and select a service provider, establish the appropriate infrastructure to administer the project, develop appropriate evaluation mechanisms and metrics to measure impact/outcomes, and initiate a pilot implementation with selected IIS.

Ultimately, an Implementation Guide will be developed for community-wide rollout detailing participation requirements, specifications for connecting with the new service, and best practices/lessons learned documented during the project's pilot phase.

For more information on the project or to volunteer as a pilot project, contact Maureen Neary at 202.552.5761 or mneary@immregistries.org.

Appendices

A. Acronyms

ACS	USPS – Address Correction Service
AIRA	American Immunization Registry Association
API	Application Program Interface
CASS	Coding Accuracy Support System
IIS	Immunization Information System
MPI	Master Patient Index
NCOA	National Change of Address
NIS	National Immunization Survey
USPS	United States Postal Service

B. Terminology

Address Cleansing*	Process of detecting and correcting (or removing) corrupt or inaccurate records from a record set, table or database. Used mainly in databases, the term refers to identifying incomplete, incorrect, inaccurate, irrelevant, etc. parts of the data and then replacing, modifying, or deleting this bad data.
Address Parsing	Divide a single address string into its separate component parts: house number, street type (e.g. St., Blvd., Ave.), street name, unit (apt, suite), city, state, zip. Used to compare, validate, de-duplicate, standardize, or geocode addresses.
Address Scrubbing	Address scrubbing is the process of correcting and verifying addresses automatically in a list or database.
Address Standardization*	Before an address can be certified as deliverable, it must first be standardized. Standardization converts an address to a standard format by correcting the address, if possible, and adding missing information, such as a ZIP code, to produce a complete address containing a street address, city, state, and ZIP code.
Address Updates*	Permanent change-of-address records consisting of the names and addresses of individuals, families and businesses who have filed a change-of-address with the USPS.
Address Validation*	The standardized address is compared against the entire list of valid addresses in the Address Management System to determine if it is a valid address. Address validity is based on many different factors, including address renumbering (via the USPS Locatable Address Conversion System) and address completeness.

Address Verification*	Process used to check the validity and deliverability of a physical mailing address. According to the USPS, an address is valid (or mailable) if it is CASS-certified, meaning that it exists within the comprehensive list of mailable addresses in their Address Management System.
CASS Certification*	Enables the USPS to evaluate the accuracy of software that corrects and matches street addresses. CASS certification is offered to all mailers, service bureaus, and software vendors that would like the USPS to evaluate the quality of their address-matching software and improve the accuracy of their ZIP+4, carrier route, and five-digit coding.
Geocoding*	Process of transforming a description of a location (textual information on addresses or places) to a location on the Earth's surface (spatial representation in numerical coordinates) – e.g. latitude/longitude.
Joint Development (AIRA Advisory Workgroup definition)	Joint Development is any collaborative development of standards, business requirements, functional or system requirements, design specifications, or production of actual software tools or applications by two or more IIS/Awardees. Work under this initiative will extend to knowledge-sharing, joint decision-making, planning, and prioritization.

*Definition collected from Wikipedia

C. Membership Outreach Polling Questionnaire

Are you sharing addresses with a state or jurisdictional Master Patient Index (MPI)? (y/n)

Do you update your addresses with a state or jurisdictional MPI? (y/n)

Does your IIS or your jurisdiction currently perform address cleansing functions? (y/n)

If yes:

> Do the address cleansing activities currently performed interact with United States Postal Service (USPS) data? (y/n)
>
> What specific address cleansing tools/services/applications do you use?
>
> Are you sharing any of these address cleansing tools/services/applications with other programs in your state or jurisdiction? (y/n)
>
> Are these tools/services commercial, public domain, developed in-house?
>
> If there is a direct cost to your program for this service, please describe the costs to the extent you are willing/able to share.

Please describe the service overall.

If no:

If you are not currently conducting address cleansing functions, or have not implemented these functions to the full level you would like, to what extent do the following barriers make address cleansing challenging in your jurisdiction?

Lack of time to develop or implement

Policy issues with sharing data with USPS

Policy issues with sharing data with other external entity

Lack of technical resources to implement service

Lack of operational resources to maintain service or process

Cost of services/applications

Concerns about impact to performance or processing time

Don't recognize the value

Even if you haven't yet implemented address cleansing functions, have you explored adding this functionality to your IIS? (y/n)

Does your IIS or your jurisdiction currently perform geocoding functions? (y/n)

If yes:

If your IIS is currently conducting geocoding functions, what specific tools/services/applications do you use?

Are these tools/services commercial, public domain, developed in-house?

If there is a direct cost to your program for this service, please describe the costs to the extent you are willing/able to share.

Please describe the service overall.

If no:

If your IIS is not currently conducting geocoding functions, or have not implemented these functions to the full level you would like, to what extent do the following barriers make geocoding challenging in your jurisdiction?

Competing priorities

Policy issues with sharing data with USPS or other external entity

Lack of technical resources to implement service

Lack of operational resources to maintain service or process

Cost of services/applications

Concerns about impact to performance or processing time

Don't recognize the value

Even if you haven't yet implemented geocoding functions, have you explored adding this functionality to your IIS? (y/n)

Is there anything else you'd like to share with us about your thoughts regarding address cleansing or geocoding?

Would you or someone else from your jurisdiction be willing to be interviewed by AIRA to provide more information on workflows, applications, services, etc. of your address cleansing/geocoding solutions?

D. Interview Guide

Address Questions:

Summarize/validate what we already know about the site from initial survey

Who is the service provider and description of the services offered?

What are the business and systems flows for how the IIS interacts with the service?

Where is this product installed? (locally within immunization program, locally within jurisdiction, externally hosted, cloud hosted, etc)

Which types of data does it process:

Existing data (data at rest)

Incoming data submitted through the User Interface

Incoming data (HL7 or flat file) submitted through a batch process

Incoming data (HL7) submitted through a real-time feed

Please describe the overall workflow of the address cleansing: (prompts: Is data extracted and reimported, or updated within the IIS?)

What business rules might exist for updating/replacing fields? (Prompts: is an entire record overwritten, or just certain fields within a record? Are there any business rules that look at the date of a new address as compared to the date of an existing address?)

Does the system address missing data, erroneous data, or both? Does the process standardize the address? Does the process update address changes per USPS?

Does the service:

1) Reformat/parse missing or erroneous addresses (example: parse SEBelmont into Southeast and Belmont)? If the system standardizes the address, what format/fields does it parse the address into?
2) Correct addresses based on USPS (example: change 12w NE Main to 123 NE Main)
3) Provide a check of address to client/responsible party name (returning forwarding information if a family has moved), and update address changes per USPS?)

Which of the following fields does the address cleansing tool evaluate?

- First Name
- Middle Name
- Last Name
- Street Address
- City
- State
- County
- Township
- Country
- Other: _____

How frequently is the address information in the tool/service updated from USPS?

In the case of erroneous addresses being corrected, does your system save or retain the uncorrected address?

In the case of addresses being compared to individuals that may have moved, does your system retain the previous address? How long are historical addresses maintained? How many historical addresses can be saved? Do you associate a date with each historical address?

Is there any impact on your system's performance (processing speed, etc.) as a result of using this service?

Have you ever evaluated the impact of this solution?
If so, do you have any evaluation results you could share with us?
If not, what would you most like to know about the impact of your solution?

Is information on updated addresses shared back with EHRs and/or end users/providers? Is it shared across Public Health? Please explain this process.

What was the initial cost of purchasing this solution?

What was the initial cost of installing this solution? Was development of new IIS functionality needed to interact with this service?

What is the ongoing maintenance/use cost, and how is it calculated? (Prompts: flat fee, subscription cost, cost per address)

What are the pros/cons/limitations of the existing service or business/systems flows?

Do you have any written documentation on the system, service, operations, and/or requirements that you would be able to share?

Do you have a specific contact with the service provider? Contact information for that individual?

Is there anything else you'd like to share with us about address cleansing?

Geocoding Questions:

Summarize/validate what we already know about the site from initial survey

Who is the service provider and description of the services offered?

Do you share the service with anyone beyond the immunization program?

What are the business and systems flows for how the IIS interacts with the service?

Where is this product installed? (locally within immunization program, locally within jurisdiction, externally hosted, cloud hosted, etc)

Which types of data does it process:

Existing data (data at rest)

Incoming data submitted through the User Interface

Incoming data (HL7 or flat file) submitted through a batch process

Incoming data (HL7) submitted through a real-time feed

Please describe the overall workflow of the geocoding process: (prompts: Is data extracted and reimported, or updated within the IIS? What business rules might exist for updating/replacing fields? Does the system address missing data, erroneous data, or both?

Do you geocode data for the following populations:

Patients/Clients:
Responsible Parties:
Providers/Schools/Partners:
Other:

Which fields does the geocoding tool evaluate (inputs)?

Street number
Street name
City
State
Zip

County
Other: _____

Does the geocoding occur before/after/independently of whether address cleansing has occurred?

How often is the geocoding tool used to update addresses?

What is the output of the geocoding process (longitude/latitude points, etc.)? How does your IIS store this output?

What the IIS does with these outputs? Do they use it for coverage assessments, targeting specific geographic areas with education, targeted outreach to providers in these areas, etc.

Have you ever evaluated the impact of this solution?
If so, do you have any evaluation results you could share with us?
If not, what would you most like to know about the impact of your solution?

What was the initial cost of purchasing this solution?

What was the initial cost of installing this solution? Was development of new IIS functionality needed to interact with this service?

What is the ongoing maintenance/use cost, and how is it calculated? (Prompts: flat fee, subscription cost, cost per address)

What are the pros/cons/limitations of the existing service or business/systems flows?

Do you have any written documentation on the system, service, operations, and/or requirements that you would be able to share?

Do you have a specific contact with the service provider? Contact information for that individual?

Is there anything else you'd like to share with us about geocoding?

E. Members of the Advisory Workgroup and Address Cleansing Working Group

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Envision Program Representatives
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Envision Vendor Representative
Steve Murchie, CEO, Envision Technology Partners (Jim Holsinger sub)

HLN Vendor Representative
Noam Arzt, President, HLN Consulting, LLC

HP Vendor Representative
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STC Program Representatives
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