



Objective

The environmental scan of patient matching practices is meant to describe current practices and trends in the health care industry, particularly pertaining to sharing clinical information. Health care organizations and their vendors continue to move in divergent directions on patient identification; this lack of commonality poses a threat to patient safety and organizational efficiency, and both problems are likely to be magnified as health information exchange gains a foothold in more areas of the country. The environmental scan's goal is to document what is happening among larger health systems and health information organizations (HIOs) around the country, how software vendors are responding to customer needs, and whether there are best practices that could be gleaned from thoughtful organizations. The scan is meant to be a snapshot rather than a scientific survey; every effort was made to gather information from as wide a variety of stakeholders as possible within the time constraints of the initiative.

Choice of Participants

Interviewees were organized into four industry sectors to provide varied perspectives on patient matching within the current landscape. Up to nine participants (hereafter referred to as organizations) were chosen in each category (health system, HIO, master data management/master patient index/health information exchange vendor, inpatient or outpatient electronic health record vendor) for structured interviews with a set list of questions unique to their industry sector.¹ Interview subjects were chosen to reflect a balance of geography, size, vendor used, and type of organization. In addition, the team spoke with other interested industry parties such as associations, companies, consumer organizations, and individuals who represent much of the continuum of stakeholders, or who have an innovative approach to matching.²

Data Collection Process

In-person and telephone interviews were carried out with more than 50 organizations and individuals;³ these sessions each included the Audacious Inquiry team. The interviews took place between September and November 2013. A comprehensive environmental scan based on the interviews will be included in the final report.

General Themes from Environmental Scan

This is a high-level summary of general themes of current operations and suggestions for possible changes that emerged from the interviews, as well as the barriers to accurate patient matching and identified best practices participants felt could help improve patient matching if instituted more broadly. Additional detail will be available in the full environmental scan.

¹ The Paperwork Reduction Act of 1980 (Pub. L. No. 96-511, 94 Stat. 2812, codified at 44 U.S.C. § 3501-3521) places limitations on federally funded surveys.

² These organizations and individuals did not receive a formal list of questions prior to or during the conversation.

³ This number includes the 32 organizations that received structured questions, and the other interested industry parties.



Current State

Data Elements

- Lack of standardization of the way data elements are formatted is a widespread problem. There is great variation in data elements used, how individual elements are entered even within the same internal system, and what data is entered when information is unknown.
- Social Security Number is used inconsistently and is collected in inconsistent formats (with or without dashes, last four, first five, hashed). The SSN is being increasingly abandoned by providers and hospitals because of privacy concerns, though some organizations and HIOs continue to use SSN for internal matching and tend not to share it outside the organization.
- Data elements maintained by health systems, HIOs, and vendors vary, and there were mixed opinions on the usefulness of various data elements for matching. The stability of some data elements seemed somewhat dependent on local geographies and cultures.

Match Methods

- Organizations and vendors use different match methods, including deterministic, weighted deterministic, probabilistic, and a hybrid of deterministic and probabilistic methods.
- Patient matching methods and algorithms (particularly attribute weights) are customized to match the demographic trends of a given organization, geography, or data set. The algorithms used to match patients within an organization may vary significantly from those used to match external records. Many interviewees said algorithms will continue to be useful even if numerical identifiers and biometrics are widely adopted.
- The ability to merge and unmerge records varies by system, including the individual/organization that can perform the merge/unmerge, the ability of a record to be unmerged based on a set point in time, and the use of automated merge/unmerge messages.

Governance

- Patient matching is of great concern to health information managers and HIOs, but does not generally rise to the level of a strategic concern at the executive level of health care organizations. Several interviewees indicated they are spending an increasing amount of time and money on fixing mismatches, when they are discovered. In most cases, manual review is usually required when fixes are necessary. Few interviewees were able to quantify the amount of resources they spend on reviewing and resolving duplicate records.
- The data source generally maintains responsibility for the records they share, meaning they are ultimately responsible for correcting matching errors in their system. HIOs generally avoid making changes to source data through automated methods and instead provide manual feedback to participants about data quality issues. Some HIOs view the correction of source data as part of their business proposition. This seems to depend on the culture and expectations of data exchange in a given marketplace.
- There appears to be limited but growing concern about potential liability and patient safety issues posed by poor matching. False positives were recognized as the largest liability, with a few organizations recognizing that false negatives may become a larger liability in the future.



OVERVIEW OF ENVIRONMENTAL SCAN

- Little progress has been made on the issue of how to resolve identification errors in source records after they have been shared outside an organization.

Challenges to Accurate Patient Matching

- Inconsistent formatting within data fields is widespread. Variation in how a name is styled makes it harder to make a match. Systems that use different fields have little in common to match against.
- Mistakes in data entry, such as transposition, require sophisticated software to adjust or take into account such mistakes during the matching process. Some of these are typographical errors, others can be tied to inadequate training of staff members creating the record, particularly if they are not administrative staff with access to training and performance improvement processes.
- Registration, business, clinical, and other systems have varying designs that may not interact well.
- Smaller organizations and practices may not be able to afford sophisticated matching methods and algorithms, and their practice software may not offer such capabilities.
- Patient engagement efforts have not yet evolved to ensure that consumers can routinely access their demographic information to confirm and update it, either with the help of a staff member or independently via a portal.

Suggested Improvements

Standardization

- Data elements entered into electronic records should be more standardized.

Data Elements

- Several data elements could improve matching if consistently applied, but there are varying views on which ones would be best. Novel elements mentioned most often included partial or full SSN, mother's maiden name, parents' first and last name, city or country of birth, previous addresses, cell phone number, and driver's license number. It was noted by several interviewees that gender is of little utility and may become more complicated over time, though it is widely used.
- The research questions did not include any specific questions on unique patient identifiers; however, many of the environmental scan participants indicated that their organizations support the study and development of a universal patient identifier (either mandated or voluntary). At the same time, there was acknowledgement that it would not eliminate the need for patient matching methods/programs and would take a number of years to have an impact.

Data Management

- Reducing the number of personnel who can create a patient record, so that only highly trained individuals had this capability was cited as a best practice.
- Include patients in the process by having them confirm demographic information in their records whenever possible. Having provenance data that identifies the demographic



information as coming from the patient may be important to including patients in the process.

- Organizations that maintain patient identity integrity programs and closely monitor accuracy of records and elimination of duplicate records tend to improve their match rates.

Other Best Practices

- There is a need to maintain cultural and socioeconomic sensitivity in any proposed interventions and be aware of the impact of asking for additional data attributes.
- Measurement of patient matching metrics, or at least starting to develop the infrastructure to allow measurement.
- HIO and vendor feedback to participants/users on data quality.
- Transparency among trading partners on internal data integrity management and data matching methods.
- Developing programs to support small practices and their practice management software as they begin to share records.

Challenges and Barriers to Improvements in Patient Matching

- Lack of visibility of this issue at the executive level.
- Investments in legacy software that may need updating or replacing.
- Cost of workflow changes in hospitals, medical practices, and other settings.
- Cost to vendors in updating and testing their products to meet new requirements.
- Difficulty in involving and training registration personnel, many of whom change jobs frequently.
- Coordination required among various hospital departments, including business, health information management, information technology, and clinical units.
- Patients may feel uncomfortable sharing additional demographic details if atypical data elements are added.