



Getty Images

# Patients Want Better Record-Matching Across Electronic Health Systems

Focus groups capture views on strategies for improvement

## Overview

The transition from paper to digital health records has transformed care delivery, but challenges persist with interoperability—the exchange of electronic data among different systems. One of the central problems is inadequate patient matching; that is, the ability to accurately link an individual’s electronic health records (EHRs) from multiple doctors’ offices or hospitals within or across health systems.

The current matching process relies largely on demographic data, such as names and dates of birth, but it does not sufficiently account for similarities among patients and data entry errors. These challenges can lead to the creation of multiple records for the same patient within a health system, failure to correctly merge records held in different locations, or the merging of records for two patients with similar information, which can lead to serious safety risks.<sup>1</sup> As a result, health care providers may lack the critical information they need to make care decisions for new patients or in emergency situations when patients are unable to communicate.

To help address the record-matching problem on a national scale and improve the interoperability of health data, The Pew Charitable Trusts conducted original research to evaluate a variety of possible solutions, including:

- Unique patient identifiers or similar systems, which can include numeric identifiers or biometrics, such as fingerprint or iris scans.
- Participation by patients in the matching of their own records, perhaps via smartphone apps.
- Agreement among all health care providers to use consistent, standardized demographic data.
- Inclusion of third-party data, such as credit bureau information.

As part of that research, Pew worked with Public Opinion Strategies and Hart Research Associates to conduct 11 focus groups in June 2017 and January 2018 with 95 participants in five cities (Denver; Houston; Nashville, Tennessee; Philadelphia; and Richmond, Virginia) to learn about their awareness of patient-matching issues and their perspectives on the proposed strategies. Although the focus groups were not nationally representative, they were diverse both geographically and across patient groups. The conversations elicited feedback from seven distinct subpopulations: parents of children 12 or younger; family caregivers of patients with chronic or serious illnesses; Medicare beneficiaries; frequent users of the health care system; infrequent users of the health care system; Democratic primary voters; and Republican primary voters. Two focus groups were held for each of the latter four of these subpopulations.

In general, participants were unaware of the problems with patient matching but did understand the issues surrounding the transfer of records between health facilities, largely through personal experience. Some recalled having their records confused with another person's.

Once informed of the problems, safety issues, and costs involved, participants across the different subpopulations generally expressed strong support for better matching and said the most important benefits would be timely access to health data, quicker and more comprehensive care, fewer preventable medical errors and patient misidentifications, and improved security and privacy. The modest differences among subpopulations, such as more skeptical views of government involvement articulated by Republican primary voters, were outweighed by the overall consistency of the responses.

## Key findings

Overall, unique identifiers or similar systems were the most popular method for improved matching, and within that category, most participants preferred biometric options. However, some were concerned about information being stolen, risks to privacy, and sale of the data. Ultimately, any data-matching solution should be responsive to patients' expectations and preferences and address their security and privacy concerns.

### Unique patient identifiers

Participants overwhelmingly supported the idea of having unique identifiers to improve matching, decrease medical mistakes, give clinicians a more complete picture of their health, and improve security compared with demographic data alone. Privacy and security issues were raised more frequently in the January 2018 groups, which were held after the hacking of millions of Americans' financial data in the Equifax credit monitoring breach.<sup>2</sup> Participants viewed unique identifiers—specifically biometric solutions—as more secure than other approaches, such as using demographic data.

To gauge reactions to different types of unique identifiers, participants were asked about a range of approaches. For example, biometrics could be coupled with standard demographic data such as names, addresses, and birthdates to provide a high degree of accuracy, or patients could receive cards with a unique number to present when obtaining care.

## Biometrics

Biometrics were the most frequent first- or second-choice solution, not only among the different types of unique identifiers, but all proposals. Focus group participants preferred this option because it would help unconscious patients, not need to be remembered by the patient, and be more accurate and secure than other approaches. Participants also indicated a familiarity and comfort with biometrics, particularly fingerprint scans, largely because of their widespread use in smartphones and airport security.

Participants did have a few concerns about biometrics. Some mentioned the cost of scanning equipment and whether it would be prohibitive for providers in low-income and rural communities, and others had questions about the effectiveness of iris scans. However, these issues were very minor in comparison with the significant overall support for this method, and some patients even said the prominence of biometrics suggested they might be cheaper and easier for providers to implement than other options.

## Smart cards

Although some participants preferred the option of wallet-sized cards with microprocessors that would contain updatable patient identification information, it was largely dismissed because they believed cards could be lost, stolen, forged, or forgotten. Many participants also felt a smart card would put complete responsibility on patients to carry it with them and not lose the card.

## Numeric identifiers

A unique numeric code—either a lifetime number selected by or assigned to each patient, or a randomly generated single-use code—could also be used to address patient record matching. Participants liked that a lifetime number would be low-cost, but they feared it might be easy to steal, and they voiced considerable confusion over how a single-use number would help solve the problem of mismatching, especially if a person was unconscious or in need of emergency care. Similarly, most participants did not like the idea of a self-selected code or number, because patients would need to remember it. Some also raised the possibility of human error, such as transposing numbers when entering data.

## Smartphone apps

A smartphone app was also tested. Patients would enter their information into an app, which would then interface with software that health care providers use to check in patients. Pew examined this approach in partnership with the Rand Corp., a nonprofit research organization.<sup>3</sup> Apps could verify phone numbers and other personal data to confirm that the correct information is sent to the EHR. An app could also replace some of the forms patients fill out in the waiting room because it would automatically transfer demographic data to providers' systems.

Some focus group participants welcomed the use of a smartphone app, because it could cut down on waiting room paperwork. This especially appealed to participants who already conduct many personal activities, such as financial tasks, on their phones.

Many participants, however, rejected this option because they said it would not be effective for patients in emergency situations or for seniors and low-income individuals, who they said are less likely to have smartphones. (According to the Pew Research Center, two-thirds of the Baby Boom generation in 2018 owns smartphones. Further, researchers at the University of Southern California indicated in 2017 that more than half of homeless adults owned a smartphone and 94 percent had a cellphone, although most had experienced high device and phone number turnover in the preceding three months.<sup>4</sup>) Participants also said that seniors, even those with smartphones, may not be able to effectively operate an app or may face challenges reading the text.

Participants also had concerns about smartphones being hacked or lost.

## Standardization

In general, focus group participants supported bringing health care providers together to agree on standards so that all facilities, from doctors' offices to large hospital systems, would capture the same data in a common format to facilitate patient matching. Participants thought this option would be easy and safe, could happen relatively quickly, and would avoid burdening patients with responsibility for remembering identifiers or otherwise ensuring that their records are accurately matched. However, participants questioned whether all health care providers and facilities could agree on standards and capture data in the same way, and some participants had concerns about the costs and feasibility of implementation across different systems.

This approach has been recommended by many organizations and experts, including the consulting firm Audacious Inquiry, which investigated matching for the Office of the National Coordinator for Health Information Technology.<sup>5</sup> Similarly, Pew and Indiana University collaborated to test the effect of standardization on patient matching. But despite its potential to improve match rates, standardization on its own will not solve all matching problems.

## Third-party data

Existing matching systems could be enhanced with additional information from external sources, such as credit bureaus and the U.S. Postal Service. This would allow the systems to associate demographic data changes with the appropriate patient, such as by linking old and new addresses when individuals move.

Some health care systems already use third-party data to help resolve identity and matching challenges, with vendors reporting match rates as high as 98 percent.<sup>6</sup> But even after being made aware of these facts, participants still had serious doubts about this approach. Patients in the focus groups questioned the accuracy of third-party data and worried that their health and financial information could be commingled and exposed, again citing the Equifax breach. (The leading approaches to using third-party data do not commingle health and financial information; instead, external demographic data are used only for reference.<sup>7</sup>)

## Conclusion

In a series of focus groups, participants were informed about the patient safety risks and costs associated with data-matching problems and the related interoperability challenges among different health record systems, and were strongly supportive of improvements. Although the groups were not nationally representative, the results nevertheless indicate that the use of a unique patient identifier, especially one based on biometrics, may have promise for the U.S. health care system.

Whatever approach is ultimately taken—whether biometrics, numeric identifiers, a smartphone app, or use of third-party data—technology developers and health care systems will need to account for patients’ priorities when addressing matching challenges and privacy concerns. However, regardless of their preferred solution, patients agreed that data matching presents a critical barrier to effective interoperability and are eager to have the problem addressed so that clinicians and individuals have access to accurate, current health information.

## Endnotes

- 1 Genevieve Morris et al., “Patient Identification and Matching Final Report” (2014), [https://www.healthit.gov/sites/default/files/patient\\_identification\\_matching\\_final\\_report.pdf](https://www.healthit.gov/sites/default/files/patient_identification_matching_final_report.pdf).
- 2 “Equifax Data Breach Affected 2.4 Million More Consumers,” Consumer Reports, last modified March 1, 2018, <https://www.consumerreports.org/credit-bureaus/equifax-data-breach-was-bigger-than-previously-reported>.
- 3 Robert S. Rudin et al., “Defining and Evaluating Patient-Empowered Approaches to Improving Record Matching” (2018), Rand Corp., [https://www.rand.org/pubs/research\\_reports/RR2275.html](https://www.rand.org/pubs/research_reports/RR2275.html).
- 4 Jingjing Jiang, “Millennials Stand Out for Their Technology Use, but Older Generations Also Embrace Digital Life,” Fact Tank, Pew Research Center, May 2, 2018, <http://www.pewresearch.org/fact-tank/2018/05/02/millennials-stand-out-for-their-technology-use-but-older-generations-also-embrace-digital-life>; Harmony Rhoades et al., “No Digital Divide? Technology Use Among Homeless Adults,” *Journal of Social Distress and the Homeless* 26, no. 1 (2017), 73-77, <http://dx.doi.org/doi:10.1080/10530789.2017.1305140>.
- 5 Morris et al., “Patient Identification.”
- 6 Verato Inc., “Verato Pens Letter to U.S. Senate and House Recommending Referential Matching as Nationwide Strategy,” accessed May 14, 2018, <https://www.verato.com/verato-pens-letter-senate-house-recommending-referential-matching-nationwide-strategy/>.
- 7 Verato Inc., “Traditional Patient Matching Is History: How to Link Records Despite Out-of-Date Data,” accessed July 25, 2018, <https://verato.com/differentiators-1-historical-data/>; LexisNexis, “LexID: Advanced Analytics for Better Identity Management,” accessed July 23, 2018, <https://risk.lexisnexis.com/our-technology/lexid>; Experian, “Universal Identity Manager: Match and Manage Patient Identities,” accessed July 25, 2018, <https://www.experian.com/healthcare/products/identity-management/patient-information-management-identity-matching-service.html>.

---

**For further information, please visit:**

[pewtrusts.org/healthit](https://pewtrusts.org/healthit)

---

**Contact:** Matt Mulkey, manager, communications

**Email:** [mmulkey@pewtrusts.org](mailto:mmulkey@pewtrusts.org)

**Phone:** 202-862-9864

---

**The Pew Charitable Trusts** is driven by the power of knowledge to solve today's most challenging problems. Pew applies a rigorous, analytical approach to improve public policy, inform the public, and invigorate civic life.