

# Master Patient Index (MPI): Are we there yet? MPI Records Challenges at the Primary Care Clinic of North Texas

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## Abstract

**Objective:** To gain a better understanding of the challenges associated with Master Patient Index (MPI) records on healthcare delivery from the Health Information Management (HIM) professionals' perspectives. DESIGN: Content analysis of in-depth interviews conducted by the organization using a semi-structured questionnaire to collect information from HIM professionals (n=5). Purposive sampling was used by the organization.

**Setting:** An urban non-profit healthcare facility located in Dallas Texas primarily serving uninsured adults in an outpatient clinic setting.

**Participants:** Health Information Management professionals (HIM) employed by the healthcare facility.

**Methods:** Coding of secondary data was used to analyse interview responses.

**Measures:** Phrases used to identify the challenge is indicated by responses by HIM professionals on how well available data match the specific requirements provided by organizational policy; that all components of the record are present (no missing data); there is no duplication of patient records.

**Analysis:** Content analysis was used in this study. Using priori coding, categories for were established and agreed upon prior to the analysis. Referential coding units were used to make inferences about the challenges that are associated with the MPI from the HIM professional's perspectives. The sampling units are the responses to one question which asked about the challenges of the MPI from the HIM professionals' perspectives. Using the Why Patient Matching Is a Challenges Model, the researchers in the study identified the key challenges in patient identification matching in the MPI records. These key challenges include lack of data standardization, frequently changing demographic data, required multiple demographic data points, and default and null values in key identifying fields. This study focused on data capture and standardization with the goal of ascertaining the key challenges associated with accurate patient matching. The anticipated outcome of the current study is to identify the challenges associated with the MPI from the HIM professional's perspectives can help organizations reduce patient information errors. Therefore, the findings may help influence the healthcare organization make system changes with regards to policies related to electronic patient data management with the MPI.

**Keywords:** Health Information Management (HIM); Master Patient Index (MPI); Demographic data

## Introduction

According to the American Health Information Management Association (AHIMA), health information is the data related to a person's medical history, including symptoms, diagnosis, procedures, and outcomes. The individuals who ensure a patient's health information and records are complete, accurate, and protected are the HIM professionals. They are extremely vital to any organization, are trained in the latest applications, and contribute to organizational workflow. The Master Patient Index (MPI) plays a major role in hospital information systems. It helps organizations understand its patient population and its own performance [1,2]. The Veterans Administration (n.d.) suggests the MPI offers a complete view of the patient's medical and treatment history and has the ability to uniquely identify patients across the organization. Health Information Management departments are often at the centre of identifying and mitigating errors, sorting through duplicate records and separating out information that has been entered in the incorrect patient record. The following research questions aim to gain better insight about the challenges associated with the MPI on healthcare delivery from the Health Information Management (HIM) professionals' perspectives. The purpose of this content analysis is to understand these challenges from the HIM professionals' perspectives at the Primary Care Clinic of North Texas and we will attempt to answer the following:

- How do HIM professionals at the Primary Care Clinic of North Texas describe their challenges associated with the MPI and then answer the sub-question of;
- How do the key challenges in the MPI hinder the organizational workflow?

## Literature Review

The research has shown that Health Information Management (HIM) professionals play an important role in MPI implementation [3]. Exploration and examination of the challenges that are associated with the Master Patient Index (MPI) Records from HIM professionals' perspectives provided direct insight into the ways to improve patient matching [1].

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Received April 24, 2017; Accepted May 22, 2017; Published May 25, 2017

Citation: Lintz J (2017) Master Patient Index (MPI): Are we there yet? MPI Records Challenges at the Primary Care Clinic of North Texas. J Health Med Informat 8: 256. doi: [10.4172/2157-7420.1000256](https://doi.org/10.4172/2157-7420.1000256)

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## Methods

In 2016, the Primary Care Clinic of North Texas conducted an informal study in an effort to gather more information about the challenges associated with the MPI on healthcare delivery from the HIM professionals' perspectives. An interview protocol consisted of a semi-structured, open ended questions developed by the organization. It was administered through in-depth interviews with five HIM professionals employed at the healthcare clinic. Purposeful sampling, in which participants are chosen based on their knowledge and experience of the MPI system, was used in this study. These participants worked in a various job roles within the healthcare clinic. Job roles ranged from billing specialist to Release of Information (ROI) specialist. According to Corbin and Strauss [4], there are no specific guidelines in regards to a sample size in qualitative studies, and it really depends on what researchers want to know, the purpose of the inquiry, and what can be done with available time and resources. In addition, suggested two to ten participants as sufficient [5-7]. The study team used this judgment to determine a data saturation point of five participants, as the interview process and analysis unfolded. In addition, since the purpose of the study is to examine the challenges associated with the MPI from the HIM professional's perspectives, there was not a control group or comparison. Therefore, the results of this study are not intended to generalize to all healthcare facilities.

Using the secondary data collected through the in-depth interviews, this study utilized content analysis to analyse the responses to one particular question asked on the questionnaire; how do you describe your challenges associated with the MPI Records? A complete list of the interview questions can be found in Table 1. The study team developed a code book using open coding. According Corbin and Strauss [4], open coding allows for exploration of the ideas and meaning that are contained in raw data. This higher level of coding enables researchers to identify any connections that may exist between codes. The first step that each study team member followed in developing the open coding involved identifying themes within subsamples. Secondly, the study team read several interviews; each team member looked at the major themes that emerged per interview question that had not been captured. Finally, the study team began to complete the codes per each interview question. For example, the team member noticed how a participant discussed his challenges in using certain features in the MPI due to a lack of proper training. At first the study team was not certain if the participant's description fit under the code key challenges in the MPI records, which the study team defined as the following: "Participants refer to their challenges associated with accurate patient matching. "As

1. How familiar are you with the Master Patient Index (MPI) records?
2. How do you describe the challenges associated with data standardization in the MPI records?
3. How concerned are you about the frequently changing demographic data in the MPI records
4. How do you describe the challenges associated with multiple demographic data points in the MPI records?
5. How do you describe the challenges associated with key identifying fields in the MPI records?
6. How do you describe the challenges associated with key challenges in the MPI records affect the organizational workflow?
7. Can you think of any way the MPI records system could improve your workflow (e.g., patient care, data analysis, record tracking)?
8. Is there anything about the MPI records that you think I should know?

Table 1: Master Patient Index (MPI) records interview questions.

a result, the study team looked for themes across other participants' interviews and saw that various participants discussed of having challenges with accurate patient matching in the MPI. In addition, the team members reviewed each of the five HIM professionals' responses and looked for and grouped distinct concepts and patterns specific to the categories related to the types of the challenges associated with the MPI. This was a consistent theme across participant interviews. Finally, the team members used the information gained through identifying and comparing participant interviews to establish a way to capture the challenges that are associated with the MPI from the HIM professionals' perspectives. The codes were then connected to the identified descriptions in the code book and placed into a word document separated by respondent. In addition, the example of the direct quotes also included in the code

## Results

In order to consider the consistency of labelling text with each code, the study team coded several pages of an interview at a time, followed by a discussion of when and how specific codes had been applied. Codes that were applied by the study team with no variations were considered to be 100% agreement among the study team members. After the study team determined the codes that were more easily and consistently identifiable (e.g., Challenges in changing demographic data, Challenges in multiple demographic data points, Challenges in identifying key fields), the members of the team then redefined on the codes that were being applied less consistently. For example, the code key challenges in data standardization proved to be problematic. A key challenge in Data Standardization was used to capture an individual participant's description of how the participant refers to his or her own challenges associated with accurate patient matching. After careful deliberation, the study team decided the key challenge in data standardization code was developed to answer the essential question: "Key challenges with accurate patient matching" rather than a general challenge. This led the study team to redefine the key challenges in data standardization code. Similarly, the study team discussed and redefined all other codes. The final goal of the data analysis in the current study was to use the new definitions of the codes until all the team members had 100% agreement. Finally step of the data analysis was to check the reliability at the beginning and at least one time during the data analysis process to make sure that coding remained consistent.

The five themes that emerged from the responses about the challenges associated with the MPI amongst HIM professional were guided by the conceptual model as shown in Figure 1 were: (1) key challenges in data standardization, (2) key challenges in changing demographic data, (3) key challenges in multiple demographic data points, (4) key challenges in key identifying fields, and (5) key challenges in the MPI that hinder the organizational workflow. These themes will be useful to provide the organizational leaders the foundational framework used to develop a holistic strategic plan of action to address the problem in the MPI records processes proactively.

### Representative comments and a narrative behind each theme are explained in the following section

**Theme 1: Key challenges in data standardization:** The analysis of the data in this theme suggests that lack of standardized procedures on how to enter data in the MPI system have caused inaccurate and incomplete MPI. A high percentage (80%) of participants indicated the problem exists due to lack of standardized procedures. In contrast, 1 of 4 (20%) participants indicated the problem exists because of lack of

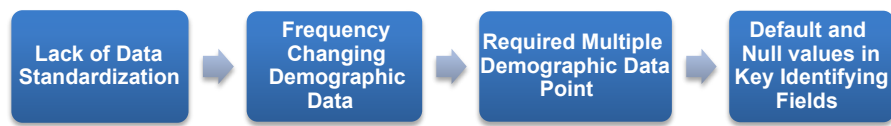


Figure 1: Why patient matching is a challenge model [1].

training for the MPI system. For example, one participant states: “One of my concerns is the increased volume of the patient records in the MPI records. And I have a hard time figuring out which record is an authenticated patient record with the same last names due to lack of standardized procedures.” Other participants also state: “I have found that the training section did not help me to become familiar with the system.”

**Theme 2: Key challenges in changing demographic data:** Data results indicated that 5 of 5 (100%) participants believed there was a lack of consistency in the data collection to handle constantly changing patient demographic information. For instance, people commonly change their name, addresses, and phone numbers and occasionally change their gender. The current data collection policy did not address this issue. Here are some of the responses from the interview:

“At my current role, I feel that there is a lack of consistency in the data collection to handle constantly changing patient demographic information” HIM professional, Respondent # 4.

“I feel we need to reengineer the data enter process in the MPI” HIM professional, Respondent # 5.

**Theme 3: Key challenges in multiple demographic data points:** The data in Theme 3 suggested the MPI records did not have enough matching data points and patient matching is based on limited data, there was a risk of overlaid records. An overlaid record occurs when two different patients are associated with the same record. In addition, data results indicated that 4 of 5 (80%) participants believed an overlaid record in the MPI was discovered when physicians and nurses were performing treatment. Some of the responses from the interview include such as:

“One of the difficulties that I have found in the MPI system is that the records did not have enough matching data points and patient matching was based on limited data.” HIM professional, Respondent # 1.

“I have seen so many two different patients are associated with the same record (overlaid record)” HIM professional, Respondent # 3.

“I feel that we could have spent more time on monitoring and conducting regular audits on MPI system data instead of deleting pre-existing overlaid records” HIM professional, Respondent # 4.

**Theme 4: Key challenges in key identifying fields:** Data results from this theme provided the information on the key identifying fields such as social security number (SSN) and medical record number (MN) in the MPI. These key identifying fields have been set as default values or no information in fields. The results indicated that 5 of 5 (100%) participants have experienced the duplicate patient record discrepancies in the MPI due to a blank entry or a default entry in one of the key identifying fields, with the majority being in MN and SSN fields. Here is a response from the interview:

“Sometimes, I could not enter the patient’s medical record number (MN) in the MPI because the field has a default value that did not let me enter MN in the field” HIM professional, Respondent # 2.

**Theme 5: Key challenges in the MPI that hinder the organizational workflow:** Data results from this theme indicated that 5 of 5 (100%) participants believed the key challenges in data standardization, changing demographic data, multiple demographic data points, and key identifying fields. A high percentage (90%) of participants indicated the problem with the overlaid records and lacks of consistency in the data collection to handle constantly changing patient demographic information have slowed down their work productivities. Some of the responses from the interview include such as:

“One of my concerns is the increased volume of the duplicate patient records in the MPI records system has slowed my workflow” HIM professional, Respondent # 3.

“Lack of a standardized direction on how to enter the record in the MPI system has slowed down my workflow” HIM professional, Respondent # 1.

## Discussion

Overall, this study demonstrates that duplicate patient record discrepancies are often due to a lack of data standardization within the organization. Moreover, due to ever-increasing changes changing in patient demographic information such as name, addresses, and phone numbers and gender. The current data collection policy was unable to meet the needs of current patient populations. Because of the complex nature of record matching and the decreased capture of an accurate, valid social security number (SSN), the medical record number (MN) is becoming ever more important to appropriately identify duplicate records. The organization leaders need to reengineer and standardize the MPI records process by developing an extensive, organization-wide MPI record clean project; especially in the area where the duplicate patient record discrepancies are often due to a blank entry or a default entry in one of the key identifying fields.

## Conclusions

Data and information collected from the in-depth interviews indicate that improvement in standardization of the MPI data is much needed to improve not only the workflow but also accuracy and completeness of the data process. Several key challenges that the participants reported include data standardization, changing demographic data, multiple demographic data points, and key identifying fields are consistent with previous research [1,8]. The summary of the five themes are shown in the following outlines:

- First key challenge that the participants indicated was lack of standardized procedures on how to enter data in the MPI system have caused inaccurate and incomplete MPI records.
- Second key challenges were the changing demographic data in the MPI in which the organization did not have a consistent data collection method to handle constantly changing patient demographic.
- Additionally, the participants also identified that the MPI records did not have enough matching data points and patient

Codebook	Descriptions	Examples
Key challenges in Data Standardization	Participants refer to their challenges associated with accurate patient matching	"I have access to the MPI records system training in-house; however, I have found that the training section on the methods of matching patient records did not help me to become familiar with the system."
Key Challenges in Changing Demographic Data	Participants refer to their challenges with a lack of consistency in the data collection	"At my current role, I feel that there is a lack of consistency in the data collection to handle constantly changing patient demographic information"
Key Challenges in Multiple Demographic Data Points	Participants refer to their challenges with a risk of overlaid records	"I have seen the records did not have enough matching data points and patient matching was based on limited data."
Key Challenges in Identifying Key Fields	Participants refer to their challenges in identifying key fields such as Social Security Number (SSN) and Medical Record Number (MN) due to default values or no information in the fields	"Sometimes, I could not enter the patient's medical record number in the MPI because the field has a default value that did not let me enter it."
Key Challenges in the MPI Hinder the Organizational Workflow	Participants refer to their concerns with the current key challenges in the MPI records affect the organizational workflow	"One of my concerns is the increased volume of the duplicate patient records in the MPI records system has slowed my workflow."
		"Lack of a standardized direction on how to enter the record in the MPI system has slowed my workflow."

Appendix 1: Sample data-driven codes.

matching is based on limited data. This is when an overlaid record occurred in the MPI.

- Finally, the participants have strongly agreed that the challenges in key identifying fields such as social security number (SSN) and medical record number (MN) in the MPI have eliminated the organization's ability to accurately match patient records. All these key challenges in the MPI have caused the slowdown the organizational workflow.

These findings demonstrate that data standardization with constantly changing patient demographic information is the organization's biggest challenge. In addition, the results of the current study provide the organization leaders the foundational framework user to develop a comprehensive strategic plan of action to address the challenges proactively. The sample data-driven codes can be found in Appendix 1.

Furthermore, in order to measure interrater reliability for the coders the researchers first calculate reliability as the number of agreements divided by the total number of agreements disagreements [8-10]. The interrater reliability results revealed that there was 100 Percent congruence in thematic identification. According to Miles and Huberman (1994), a reliability of 90% or better is necessary for maximum consistency of coding. The same two study team members then met to review their findings. Identified themes showed high concurrence between the investigators. Themes were compared to look for trends. Thematic saturation was reached at five participants. Participant' reports of perceptions and use of MPI records were captured and quantifiable results in the form of tallies were available for some variables.

### Limitations

The purpose of the study is to examine the challenges associated with the MPI from the HIM professionals' perspectives; there was not a control group or comparison. Consequently, the participants interviewed represented only the primary healthcare facility located in Dallas Texas primarily serving uninsured adults in an outpatient clinic setting and may not representative of other settings such acute care, or large outpatient clinic, for example. In addition, although purposeful sampling is justified by suggestions, the conclusions are drawn from a small sample of purposefully selected HIM professionals within the primary healthcare centre should be considered within the context of its limitations [4,11,12]. Other limitations may include aspects of the

interview process, to include interview length and the limited numbers of questions that may have not have been as comprehensive as possible. Therefore, the results of this study are not intended to generalize to all healthcare facilities.

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Citation: Lintz J (2017) Master Patient Index (MPI): Are we there yet? MPI Records Challenges at the Primary Care Clinic of North Texas. J Health Med Informat 8: 263. doi: [10.4172/2157-7420.1000263](https://doi.org/10.4172/2157-7420.1000263)