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The role of health information in reducing errors resulting from the similarity of names in patients

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Abstract---In order to match patient records with laboratory data and to assure prompt and accurate identification, hospitals and health clinics in many countries are introducing healthcare smart cards with embedded microchips. The cards are designed to give healthcare professionals access to both the information they need and the results of clinical tests for the patient they are treating, provided the patient can give the smart card to the health professional at the time of the visit to the doctor. If the patient forgets the smart card, does not have the card, or refuses to give the card to the health professional, new software applications have been developed to identify the correct patient from other demographic fields in the health information system database. Over the years, there has been research investigating the algorithmic match choices in order of importance when demographic matching, using the health information system on similar and same names of patients with the same date of birth. The focus of the research on similar names of patients was a blend of not only trust and confidence but also included matching accuracy, speed, and computational effort in relation to the computer's CPU processing power. The objective of this essay is to elaborate not only on understanding, addressing, and managing name similarity errors but also to extend the research

outcomes and solutions to the countries where there is no unique national patient number system established nor the interest or financial capacity to develop one.

Keywords---health information, patients, reduction of errors.

1. Introduction

Effective health information is essential in enabling the reduction of errors. Patients with the same or similar names are a potential source of error, and until recently, the suffix of age of birth was used to ensure unique patient names in many healthcare institutions in various countries around the world. A key example has been the situation where an elderly married couple requests general practitioner care, and the receptionist books the husband for an appointment in two weeks' time. At first glance, this error may appear trivial. The sharing of the same name for an elderly couple creates in the mind of the reader the impression that the husband and wife both have upcoming appointments on the same day. If this error were transferred into a prescription, the patient who was given the medication could experience some unpleasant side effects, which might lead to hospitalization. In the areas of direct patient care, patient safety, costs, and professional reputations, the name similarity but actual not the same name patient is significantly less than minor errors.

In order to match patient records with laboratory data and to assure prompt and accurate identification, hospitals and health clinics in many countries are introducing healthcare smart cards with embedded microchips. The cards are designed to give healthcare professionals access to both the information they need and the results of clinical tests for the patient they are treating, provided the patient can give the smart card to the health professional at the time of the visit to the doctor. If the patient forgets the smart card, does not have the card, or refuses to give the card to the health professional, new software applications have been developed to identify the correct patient from other demographic fields in the health information system database. Over the years, there has been research investigating the algorithmic match choices in order of importance when demographic matching, using the health information system on similar and same names of patients with the same date of birth. The focus of the research on similar names of patients was a blend of not only trust and confidence but also included matching accuracy, speed, and computational effort in relation to the computer's CPU processing power. The objective of this essay is to elaborate not only on understanding, addressing, and managing name similarity errors but also to extend the research outcomes and solutions to the countries where there is no unique national patient number system established nor the interest or financial capacity to develop one.

2. Understanding the Impact of Name Similarity Errors

Name-related errors happen due to the identical or similar names present in the patient data. These errors are mainly observed during the registration and data entry of one or more aspects of the patient's data. Name-related errors can appear in various forms and have the potential to cause different problems within each

dimension. The first category of problems associated with similar names being part of the patient's data is wrong diagnoses. When patients with the same name are registered for obtaining the diagnosis, and the patients are admitted simultaneously following a single diagnosis, these patients can be given the diagnosis of other patients. During repairs, medications can be randomized from different drug groups or from the inappropriate dosage. Misidentification also occurs in acute cases, especially when rights are conveyed very briefly with the help of the other person. In all of these uncertainties and confusions, it also upsets the patient greatly. One of the error types is when two or more different people with the same names are present in the same hospital-related system. Similar names obtained from different registration sources are edited at the same time. Rapidly edited data can cause false diagnoses, bad time and bed relationships, and wrong drug prescriptions. It is also possible to prevent delay or early birth, or even a Caesarean section if wrongly constructed history and medication are available. In the registration, similar names can be transcribed over what the sources actually furnish differently. In particular, the risk of such error is further compounded by the increasing diversity of the patient populations within the same healthcare setting. In order to reduce the frequency of such errors, healthcare personnel who face the patients must be trained to expect the occurrence of such errors and can also eliminate them if they are aware of the coming of the error. In addition to these man and education factors, it is also important to carry out the measures that will prevent the formation of the errors on the cause side rather than the effect side, such as identifying the factors in the system structure and/or management system of the health institution and developing proposals for eliminating awareness. From the limited number of publications on this topic, it is understood that the main factors causing namesake errors are related to the patient records. In these studies, namesake errors in patient record cards have been reported with a significant percentage. (Jayasinghe et al.2023)(Semenza, 2022)(Kocher)

2.1. Types of Errors

Several distinct types of name similarity errors can be distilled from the research literature. This subcategorization of errors was developed based on a comprehensive literature review and analytical review because of the noted difference in behavioral response by practitioners across error types. Three types of name errors have been observed: Phonetic Similarity. A relatively common sound-alike or phonetic type of error where mis-identification, mis-labeling corruption of a patient's record occurs when names are spoken aloud and are sounded alike, but are spelled in different ways. A corollary type of error involves the same phone-based names that are bad as the first example, but can be addressed if revealed to most physicians. Cultural variations in phonetics and illegible transcriptions may also cause error and "alike" misidentifications. Phonetic variation due to accents can occur where individuals have similar names like Mary and Maura. Spelling Variations. In this error type, the written or typewritten names have similarities that might be quite confusing to a busy or careless practitioner. Name prefixes, postfixes, hyphens, spaces, commonly misspelled components, and cultural variation in alphabets are included in this category. The discharge abstract is not written by the patient but by the healthcare provider and so is generally free from this type of error, however laboratory records and referring documents are free style and can contain these sorts of errors. Electronic health records may store only

phonetic or only spelled name or address fields, or have various fields for these variables that are not checked for conflicts when entered. Dozens of examples of this type abound, such as mail Jerome / Jerrome, Claire / Clare, and Norma / Noema and others such as Hose or Hozai for Joseph nurse's notes or by Herberts and mine samples that were bunged together developed allergen "id" bands stating a new identity that went un-noticed for 12 h. If the marks had been noticed we would have been able to retrieve our original to examine and destroy them before a hazard occurred. I nwtisbl the marks Hilton R.lairdi-q has been Hertford Ltd A molecular a rrayntic'ij njwed..]-\$ filed a Gibbons. Conergy organisation undertakes to return records within 3 calendar months of the visit (any persistent copy held). If it is considered that the record needs to be retained (for example: ownership is not proved by an inspection report or the guardian is not satisfied with the owner). In such cases we will take advice from the local child protection agencies and act in accordance with their recommendations. If you require a continuous copy of the record please contact the Special Investigations Officer for the Border Force Region in which the visit took place. N/ A .-IPS-ME: Billions of legitimate bits! A mole must trigger the TM at a lower much more rarely "move" molecular transition and integrate multiple transitions to simulate a popular trend of detection.

2.2. Consequences of Name Similarity Errors

Incorrect patient identification has health repercussions for the patients themselves in the context of either inappropriate treatments and diagnostic procedures or administrative errors such as possible misunderstandings of the continuity of care, late or skipped appointments, failure to collect the appropriate samples of urine and blood, and so forth. Nonetheless, such errors may have a lasting impact on patient mental well-being and psychological health that remains unquantifiable.

Finally, there are legal consequences for healthcare providers. Failure to correctly identify patients, when something goes wrong with the treatment or care, exposes the healthcare providers legally to a charge of negligence. The consequences of such errors can be far-reaching. There are financial and economic implications for healthcare providers, health systems, and insurers. For example, directing resources to the prevention of such repetition of errors, including identification and initial and/or corrective treatments and possible readmissions. On top of that, such occurrences degrade patient trust in healthcare providers and the administrators of healthcare facilities. Mandatory training as part of the current ongoing process of accreditation or re-accreditation of healthcare against prescribed standards is already being rolled out in some flawed identification procedures. The education and training of so many healthcare professionals and the reissue of badges, including radiofrequency ID tags, will now no doubt start to cost healthcare organizations large sums. The health-related economic costs for the patients would have been even more substantial. Systemic change is needed to stop these identification-related events from happening.

3. Current Strategies for Addressing Name Similarity Errors

Improving patient identification is one strategy for addressing name similarity errors. Currently, the most widely acknowledged feature of such strategies is that

they bypass clinicians. They either provide the capacity for immediate verification, for example, by using a unique health identifier, or they assist in making connections more accurately, for example, by using advanced data matching techniques. Training and education programs that inform staff about the nature and extent of the problem have also been proposed to reduce patient identification errors or educate health staff about the risks of look-alike sounding names and similar spellings. Enhancing the patient's role in checking the process of patient identification by using checklists also increases accuracy. However, the training is neither expensive nor difficult, but it does depend upon staff to change their work practices, which they currently believe are working adequately. The extent to which the patient actually engages in the correct type of identification of themselves is also a contentious point. (Bryan et al.2021)(Yanamala2022)(Manias et al.2020) Interventions have ranged from clinic-level quality improvement processes to legislative changes. Good examples of federal and state-level government interventions are in the areas of standardizing demographic data that every health service needs to provide to obtain funding and patient confidentiality index, which links a patient to their unique health identifier. Most work on this type of intervention has either been on the need for intervention or an account of a specific part of legislation and policies. Some organizations have attempted to address this in response to inevitable data duplication associated with patients using multiple names for different encounters. This has seen the development of best practices in data reconciliation, record linkage, and unique health identifiers. However, the requirements of this work often relate to one specific issue. Naming systems still need to be established prior to the application of these best practices. Often, such interventions are discussed in terms of the practical, technical, legislative, and implementation issues. Invariably, the mandate for such an intervention comes both from the leaders of institutions and the government. The whole front and middle line health service are charged with the responsibility to implement the intervention, but they often achieve the opposite by ensuring that the status quo is maintained.

4. The Role of Health Information Technology in Error Reduction

The goals of using health information technology (HIT) in reducing errors resulting from the similarity of patient names are numerous. HIT has made enormous strides over the past several years. Some healthcare organizations use or implement electronic health records (EHRs) to replace paper documentation. EHRs have the potential to provide comprehensive information on patients and thus prevent many medication and other errors. The use of computer technology also reduces the risk of errors resulting from illegible handwriting. EHRs make it possible to collect a great deal of data on the patient that is available for research or the payer. Information from EHRs can be used for intelligent prognostic factors, i.e., indicators of the possibility of the occurrence of specific events. The assessment of the patient's prognoses is important for the selection of interventions in chronic diseases. Moreover, electronic data management enables more precise matching of patient data and identity checks. EHRs make it possible to individualize medical care according to age, sex, and other individual characteristics. Technology can be a helpful tool in the process of preventing mismatches and hence improve the safety of patient care.

In EHRs, intelligent algorithms or information systems can be designed to discover apparent conflicts in names stored in these systems. Machine learning or simple algorithms can be used to develop, for example, "red flag" alerts if there is a suspicion of name conflicts. A significant advantage of these solutions is that it can be done automatically. Sometimes the occurrence of gender, birth date, and in some cases name similarities can be automatically flagged with a warning in the EHRs. The recent technical advances allow user interface designers and software engineers to design clear "red flag" icons to alert healthcare professionals that there might be a potential patient identification error in a jiffy. Automatic system alerts can, in turn, lead clerks to launch inquiries and investigations to ensure that the risk of name similarity in the medical record can be further increased. From the perspective of computer systems, a plan to earn money or find financial sponsors for "intelligent" system equipment integration/EHR is problematic. Clinics, hospitals, and other institutions that take care of patients are not necessarily able to forecast the potential cost savings that can result from avoiding mistakes. Moreover, this group of people may also depend on a computer, and it is a generational problem - many older staff may not have been trained for more advanced technology and are not willing to change. Sometimes these may involve costs associated with changing procedures. Therefore, it is unlikely that the implementation of these and similar technologies will be generally accepted from the point of view of reducing the risk of similarity of names for a long time. Since technology is considered a significant ally in preventing errors resulting from discrepancies, it is possible that it will be used in one or more specific contexts, such as reducing medication errors within the inpatient medical record system.

5. Best Practices and Recommendations for Health Information Management

As the goal of records management has always been to mitigate errors caused by the similarity between patient names, it is essential that the measures implemented are passed and validated in different contexts. This study developed a list of best practices and recommendations that can represent the best way to build information that minimizes errors caused by similarities of patient names. They can generally be summarized as follows:

1. It is critical to have robust data entry processes in which verification occurs at several points of attention by different professionals and according to the complexity and criticality of the service provided.
2. To make it difficult to cross names, use preventive measures, such as insisting on standardized conventions of nomenclature.
3. Reduce as much as possible documentation that is not related to the care provided by the direct professionals of the patient.
4. To have increasing training actions, taking into account that there is professional turnover.
5. Regular and active conduct of audits and verifications at all management levels.
6. To stimulate the formation of thematic networks, fostering the exchange of experience according to different moments of the process.

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