Largest study to date of electronic dental records reviews understudied populations

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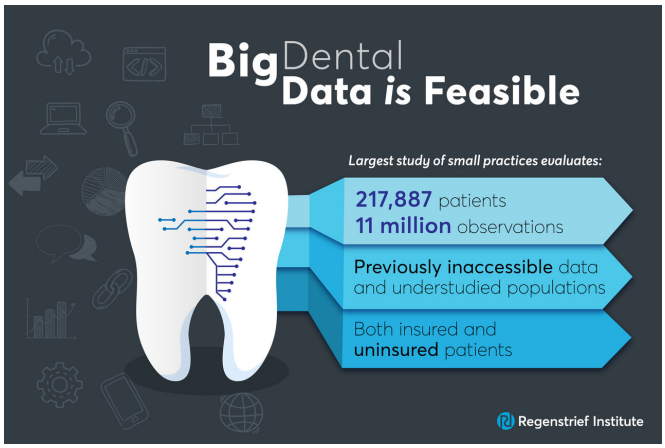

The largest study to date of electronic dental records (EDRs) delves into both previously inaccessible data and data from understudied populations with the ultimate goal of improving oral treatment outcomes. In the groundbreaking study, researchers from Regenstrief Institute and Indiana University School of Dentistry evaluated de-identified data from EDRs of insured and uninsured patients containing more than 11 million observations, with observation periods as long as 37 years. Credit: Regenstrief Institute

The largest study to date of electronic dental records delves into both previously inaccessible data and data from understudied populations with the ultimate goal of improving oral treatment outcomes. The work presents a learning health system—a mechanism for dentists to learn from their own experience and the experiences of fellow practitioners.

Researchers led by Regenstrief Institute Research Scientist Thankam Thyvalikakath, DMD, Ph.D., associate professor and director of the Dental Informatics Core at Indiana University School of Dentistry, evaluated de-identified data from the electronic dental records (EDRs) of 217,887 patients of 99 solo or small dental practices across the United States. These EDRs contained more than 11 million observations, with observation periods as long as 37 years.

The study determined that it is feasible to mine and utilize enormous amounts of EDR data to learn which dental therapies work and which do not, empowering quality improvement by individual dentists. EDR data is sufficiently reliable for purposes beyond the clinical care of individual patients.

Learning from aggregating data across practices gives each dental practitioner the opportunity to acquire knowledge not only from his or her own patient data but also the opportunity to compare their practice with their peers. Information obtained during each patient's visit thus contributes to improved care for all, creating a true learning health system.

Now that the they have completed the proof of concept; the researchers will use the data to evaluate of the long-term effectiveness of two common dental procedures performed on permanent teeth—root canal therapy and tooth-colored fillings in rear teeth. Data analysis for that portion of the study, which will determine how well and how long root canal treated teeth and back teeth filled with tooth-colored fillings continue to function, will help both dentists and the patients make evidence-based care decisions. Data analysis is currently nearing completion and the findings will be published in the future.

"Here in the real world of the dentist's office we are seeing patients with all kinds of real-world conditions—pain, underlying medical conditions, lack of adequate past oral health care—so this large data set provides a unique insight into the treatments offered in the type of dental offices where most Americans receive care," said Dr. Thyvalikakath, the founding director of Regenstrief-IU School of Dentistry dental informatics program.

Information on demographics, reason for visit, medical and dental history, social history, tooth characteristics and treatment, as well as practice and practitioner characteristics was collected for each patient visit.

Dr. Thyvalikakath describes the work as groundbreaking in four areas:

1. Dentists were able to share their data for research in an anonymized process with their EDR vendors' help, because a typical solo dentist or even small practice does not have dedicated IT staff.

2. Data from two electronic dental record systems with varying formats and operating systems were combined. Interoperability has proved difficult with data from electronic medical record systems.

3. It is the largest study to evaluate data quality in a regular patient setting.

4. It looked at the oral health and treatment options of both insured and uninsured patients. Past studies have relied on insurance records and thus have provided no information on uninsured patients.

"Findings derived from patient data in real-world conditions is typically less difficult for clinicians to translate at the point of care than studies performed in large health systems which often represent a patient population that does not mirror the community dentists see in their practices," said Dr. Thyvalikakath. "We are presenting a mechanism for dentists, many of whom practice by themselves or with only one or two others, to learn from their own experience and from the experiences of their peers to assist in improving skills and facing problems."

"Leveraging Electronic Dental Record Data for Clinical Research in the National Dental PBRN Practices" is published in the peer-reviewed journal, *Applied Clinical Informatics*.

Provided by Regenstrief Institute

dental-understudied.html