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ABSTRACT

Collaborative development of use cases for geospatially enabling a health information exchange

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Objective
This presentation describes a collaborative approach for realizing the public health potential of a geospatially enabled statewide health information exchange.

Introduction
Given the clear relationship between spatial contexts and health,[1] the Indiana Center of Excellence in Public Health Informatics (ICEPHI) aims to serve both the needs of public health researchers and practitioners by contextualizing the health information of large populations. Specifically, ICEPHI will integrate one of the nation's largest health information exchanges, the Indiana Network for Patient Care (INPC),[2] with well-established community information systems that collect, geocode, organize, and present integrated data on communities in Indiana and surrounding states, including data on public safety, welfare, education, economics, and demographics.[3]

Methods
To integrate more than 3 billion clinical results for more than 12 million patients in the INPC with rich, locally available contextual data, an ongoing process for geocoding all clinical data is being developed that links the addresses associated with electronic medical records to geographical coordinates and other useful geographical identifiers including census block group data. To leverage this new data, a collaborative team of information scientists and public health researchers, practitioners, and decision makers is developing use cases that reflect diverse public health needs. These use cases in turn are being used to refine system requirements. ICEPHI anticipated that requirements would vary based on the spatial context relevant to the public health issues of interest[1,4] and targeted sources of contextual information.[5]

Results
The use case requirements differ across different dimensions. These dimensions include accuracy of geocoding results, type of geographic identifier (for example, county, census tract, neighborhood), and date of geographical identifier (for example, 1990 versus 2000 census tract ID). Some use cases, such as targeting neighborhoods for clinical interventions, do not require the same level of geocoding precision as others, such as assessing whether proximity to environmental health hazards relates to an individual's risk of a particular health outcome. Street centerline addressing geocoding is sufficient for the first use case example, while property parcel geocoding is more desirable for the later example. The most commonly needed contextual data and associated requirements for allowing proper linkage were identified for initial prototype development. The prototype geocoding service will return geographical coordinates and block group ID based on the use of a composite geocoding method that uses multiple spatial reference layers. Some use cases will require that geocoding be restricted to the use of a more limited set of reference layers. The developed metadata protocol will allow the source of generated spatial attributes to be tracked and reported.

Conclusions
Enabling geospatial data within health information exchanges has great potential for supporting and advancing public health research and practice. Multi-sector collaboration on the development and evaluation of associated uses cases allows informed decisions on system integration,

allowing spatially aware research and practice to be more quickly realized.

The functionality of the ICEPHI geocoding service will be expanded as use cases are further developed and prioritized. Potential uses of de-identified and aggregated health information by community-based organizations will be considered in the future.

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