

Interoperable Electronic Health Record Databases



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Problem Overview and significance

One of the most critical components of healthcare is the medical record, which not only documents recent test results but also supports patients throughout their lives. Nowadays **electronic health records (EHRs)** have become the standard. Despite this advancement, significant challenges remain, particularly regarding the transferability and interoperability of records across healthcare systems, both within a country and internationally. This research focuses on developing interoperable electronic health record databases at the state level in **the United States and the regional level in Italy**. Ultimately, this study aims to analyze how improved data sharing among hospitals and healthcare providers can enhance continuity of care, targeting the GCSP goal of **advancing health informatics**.



Considerations and Limitations

- Implementation requires aligned policy support, investment in technical infrastructure, and stakeholder coordination. Specifically:
- Incentivize **adoption of shared standards** through funding and regulation.
- Ensure **robust technical infrastructure** (secure data exchange layers, middleware).
- **Align performance metrics** so quality and safety improvements can be evaluated consistently.
- Provide **training** for healthcare IT and clinical staff on interoperability protocols.

Background research and gap

- Medical records are essential for documenting patient history and supporting clinical decision-making.
- Poor interoperability leads to fragmented patient information, which can result in duplicated tests, incomplete medical histories, delayed care, and increased administrative burden for healthcare providers.
- International use of medical records highlights additional challenges, including variations in national healthcare systems, legal frameworks, privacy regulations, and technical standards.
- The shift from paper-based records to Electronic Health Records (EHRs) has improved **data accessibility, storage efficiency, and documentation quality** within individual healthcare institutions.
- Studies emphasize the **need for standardized, interoperable health information systems**, particularly at regional or national levels, to improve data sharing among providers and enhance continuity of care across healthcare settings.

Next Steps

- **Cybersecurity and data privacy:** Protecting patient confidentiality, maintaining patient rights, and preventing unauthorized access, data breaches, or misuse of sensitive health information are critical challenges.
- **Regulatory and policy differences:** Government policies, legal frameworks, and healthcare regulations vary by country and region, which can limit the adoption and standardization of interoperable systems and complicate cross-border data sharing.
- **Lack of standardized data formats:** Hospitals, states, and regions often follow different clinical guidelines, documentation practices, and coding systems for patient histories and test results.

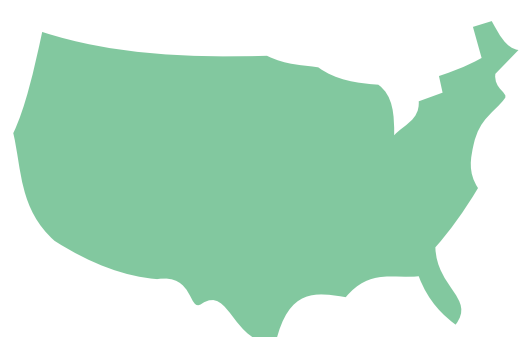
Proposed approach

Proposed solution or strategy

- Develop a standardized, **interoperable state-level (U.S.) and regional-level (Italy)** EHR database that uses common technical standards to enable seamless bidirectional exchange of clinical data between disparate healthcare systems.

How it differs from existing approaches

- This approach emphasizes **cross-institutional and regional/state-wide standardization** rather than isolated system linkages.



Lessons Learned From COIL

- Value of **international collaboration**
- Cultural and system-level healthcare differences
- Stronger **teamwork, collaboration and leadership skills**



References

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