Database Open Access

MIMIC-III Clinical Database Demo

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Abstract

MIMIC-III is a large, freely-available database comprising deidentified health-related data associated with over 40,000 patients who stayed in critical care units of the Beth Israel Deaconess Medical Center between 2001 and 2012 [1]. The MIMIC-III Clinical Database is available on PhysioNet (doi: 10.13026/C2XW26). Though deidentified, MIMIC-III contains detailed information regarding the care of real patients, and as such requires credentialing before access. To allow researchers to ascertain whether the database is suitable for their work, we have manually curated a demo subset, which contains information for 100 patients also present in the MIMIC-III Clinical Database. Notably, the demo dataset does not include free-text notes.

Background

In recent years there has been a concerted move towards the adoption of digital health record systems in hospitals. Despite this advance, interoperability of digital systems remains an open issue, leading to challenges in data integration. As a result, the potential that hospital data offers in terms of understanding and improving care is yet to be fully realized.

MIMIC-III integrates deidentified, comprehensive clinical data of patients admitted to the Beth Israel Deaconess Medical Center in Boston, Massachusetts, and makes it widely accessible to researchers internationally under a data use agreement. The open nature of the data allows clinical studies to be reproduced and improved in ways that would not otherwise be possible.

The MIMIC-III database was populated with data that had been acquired during routine hospital care, so there was no associated burden on caregivers and no interference with their workflow. For more information on the collection of the data, see the MIMIC-III Clinical Database page.

Methods

The demo dataset contains all intensive care unit (ICU) stays for 100 patients. These patients were selected randomly from the subset of patients in the dataset who eventually die. Consequently, all patients will have a date of death (DOD). However, patients do not necessarily die during an individual hospital admission or ICU stay.

This project was approved by the Institutional Review Boards of Beth Israel Deaconess Medical Center (Boston, MA) and the Massachusetts Institute of Technology (Cambridge, MA). Requirement for individual patient consent was waived because the project did not impact clinical care and all protected health information was deidentified.

Data Description

MIMIC-III is a relational database consisting of 26 tables. For a detailed description of the database structure, see the MIMIC-III Clinical Database page. The demo shares an identical schema, except all rows in the NOTEEVENTS table have been removed.

The data files are distributed in comma separated value (CSV) format following the RFC 4180 standard. Notably, string fields which contain commas, newlines, and/or double quotes are encapsulated by double quotes ("). Actual double quotes in the data are escaped using an additional double quote. For example, the string `she said "the patient was notified at 6pm"` would be stored in the CSV as `"she said ""the patient was notified at 6pm"""`. More detail is provided on the RFC 4180 description page: https://tools.ietf.org/html/rfc4180

Usage Notes

The MIMIC-III demo provides researchers with an opportunity to review the structure and content of MIMIC-III before deciding whether or not to carry out an analysis on the full dataset.

CSV files can be opened natively using any text editor or spreadsheet program. However, some tables are large, and it may be preferable to navigate the data stored in a relational database. One alternative is to create an SQLite database using the CSV files. SQLite is a lightweight database format which stores all constituent tables in a single file, and SQLite databases interoperate well with a number software tools.

DB Browser for SQLite is a high quality, visual, open source tool to create, design, and edit database files compatible with SQLite. We have found this tool to be useful for navigating SQLite files. Information regarding installation of the software and creation of the database can be found online: https://sqlitebrowser.org/

Release Notes

Release notes for the demo follow the release notes for the MIMIC-III database.

Acknowledgements

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Conflicts of Interest

The authors declare no competing financial interests.

References

1. Johnson, A. E. W., Pollard, T. J., Shen, L., Lehman, L. H., Feng, M., Ghassemi, M., Moody, B., Szolovits, P., Celi, L. A., & Mark, R. G. (2016). MIMIC-III, a freely accessible critical care database. Scientific data, 3, 160035.

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Discovery

DOI (version 1.4):
https://doi.org/10.13026/C2HM2Q

DOI (latest version):
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Topics:
critical care | electronic health records | mimic

Project Website:
https://mimic.physionet.org

Corresponding Author

You must be logged in to view the contact information.

Files

Total uncompressed size: 103.0 MB.

Access the files

- Download the ZIP file (13.4 MB)
- Request access using Google BigQuery.
- Download the files using your terminal: `wget -r -N -c -np https://physionet.org/files/mimiciii-demo/1.4/`
- To download the files using AWS command line tools, first configure your AWS credentials.

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