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MIMIC-III Data Linkage

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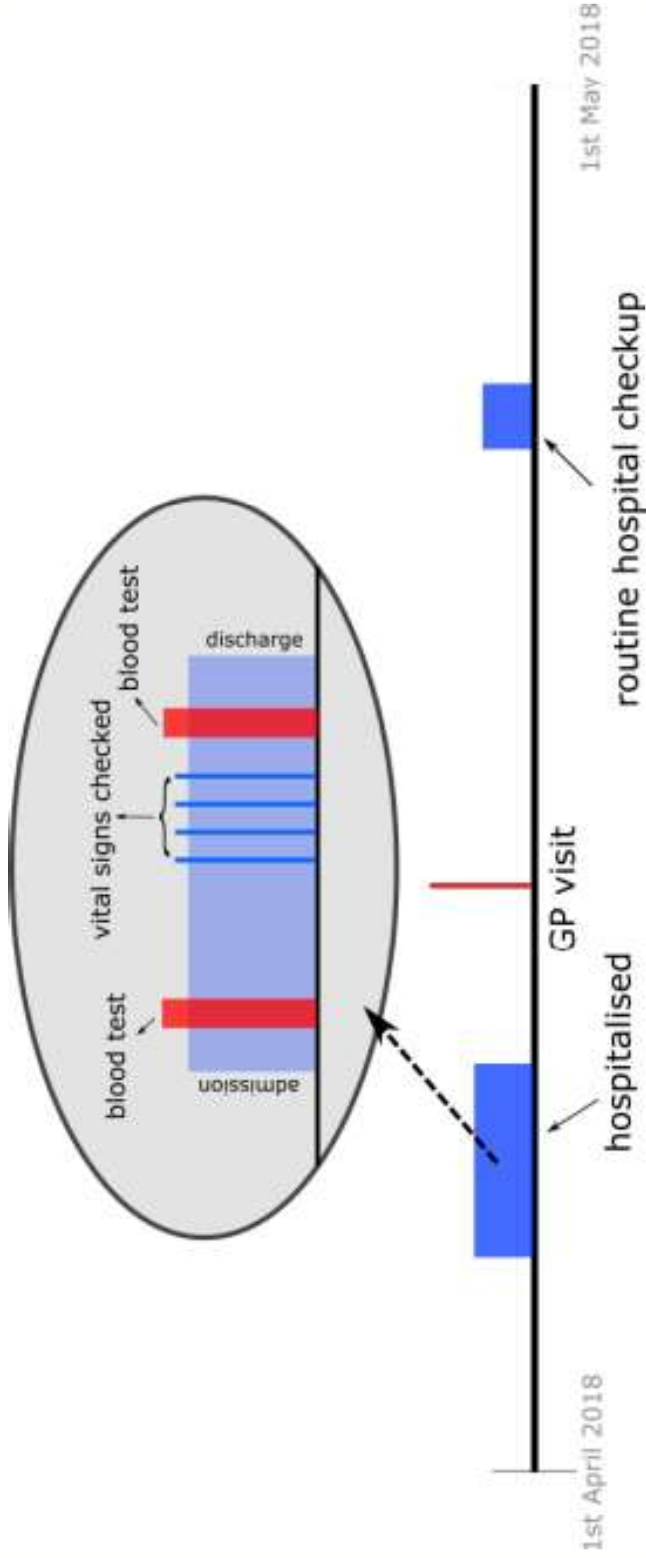Lead of the Computing Technologies for Healthcare Theme

https://www.gla.ac.uk/schools/computing/staff/fanideligianni

Patient Timeline Example

Date	Event
5/04/18	Hospital admission
	Blood test
	Vital signs checked
6/04/18	Vital signs checked
	Blood test
7/04/18	Hospital discharge
14/04/18	GP visit
24/04/18	Routine hospital check-up

MIMIC-III

- Freely accessible deidentified critical care dataset under a data user agreement
- Available both for academic, industrial research and higher education
- Dataset spam over a decade
- Analysis is unrestricted
- Interoperability – data integration
- Reproducibility
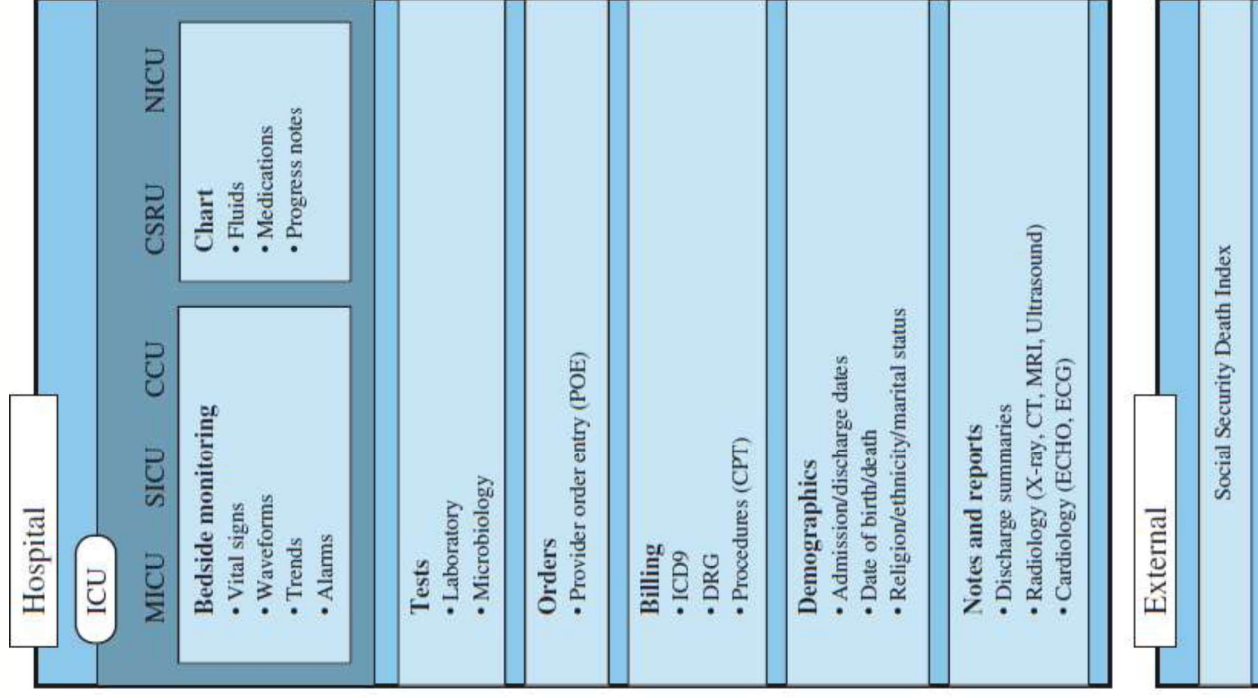
Johnson et al. 'MIMIC-III, a freely accessible critical care database', Scientific Data, 2016.

MIMIC-III: De-identification

- Compliance with Health Insurance Portability and Accountability Act (HIPAA)

- Remove all patient directly identifiable information

- Dates were shifted into future by a random offset

- Time of day, day of the week and approximately seasonality were conserved during ate shifting.

- Patients over 89 years old were shifted and appear to be over 300 years old

- Protected health information was removed from free text fields

MIMIC-III: Data Usage Requirements

- The researcher must complete a course in protecting human research participants according to Health Insurance Portability and Accountability Act (HIPAA) requirements.

- The researcher must sign a data use agreement, which outlines appropriate data usage and security standards, and forbids efforts to identify individual patients.

Summary

- MIMIC III links data across across hospital, ICU units and death registry
- It contains lab examination, medications, ICD codes and vital signals
- The only database of its kind freely available without major restrictions for its use
- Data are deidentified and dates are shifted relatively to protect patients' privacy

References

- Johnson et al. 'MIMIC-III, a freely accessible critical care database', Scientific Data, 2016.

- Gamal et al. 'Standardized electronic health record data modeling and persistence: A comparative review', Journal of Biomedical Informatics, 2020.