

Medical data analysis infrastructure
- Attempt at the Kochi Medical School -

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Background

USA




AMGA
(American Medical Group Association)

Kochi Medical School Hospital



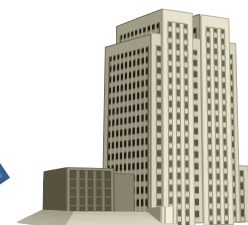
IMIS
(Integrated Medical Information System)

Electronic Health Record



Penetration: 21.8%(<400 beds)
68% (>400 beds)

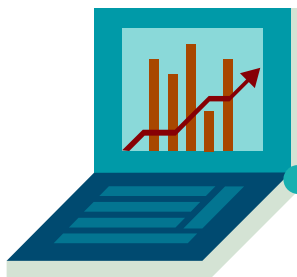
Japanese Association of Healthcare Information Systems industry



Health, Labour and Welfare Ministry
Online by receipt



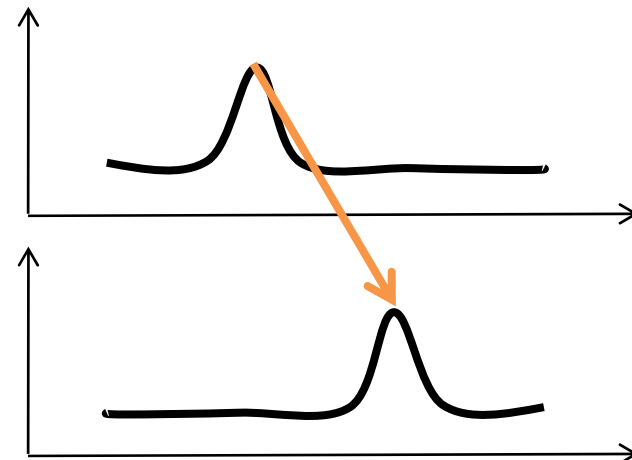
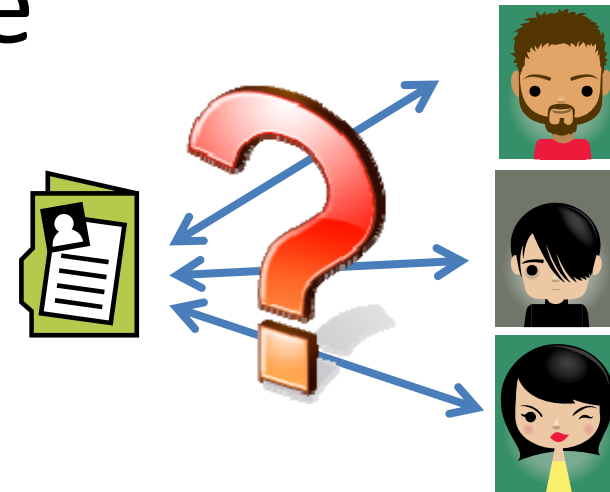
Data analysis



- Quality enhancement of medical treatment
- Secondary use for EBM

Purpose

- Data anonymizing
 - Privacy protection
- Large variety of data type
 - Number, text, waveform data, image
- Standardization of test data in different hospitals
 - Existence of test error



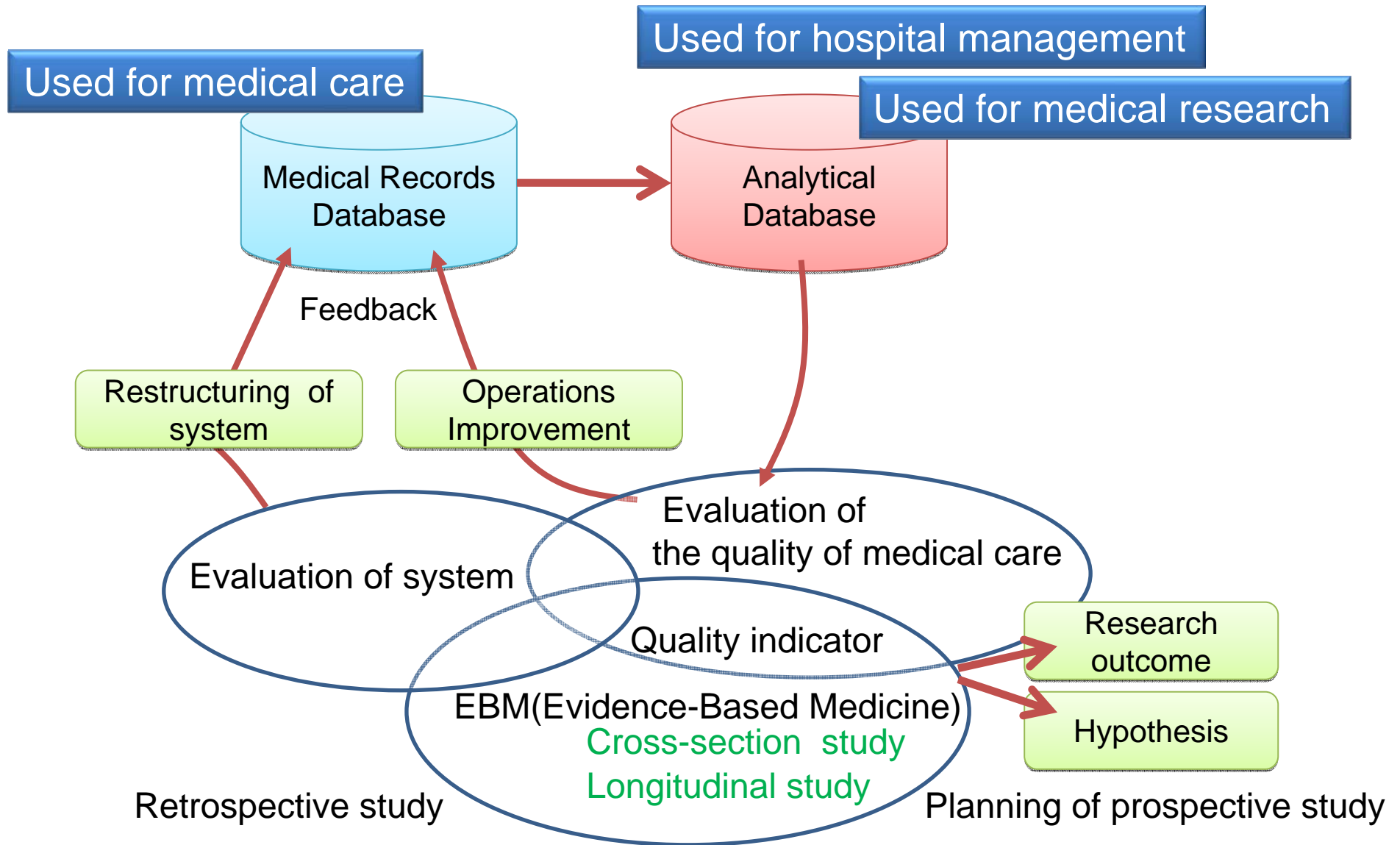


Fig1. Need for Analytical Database

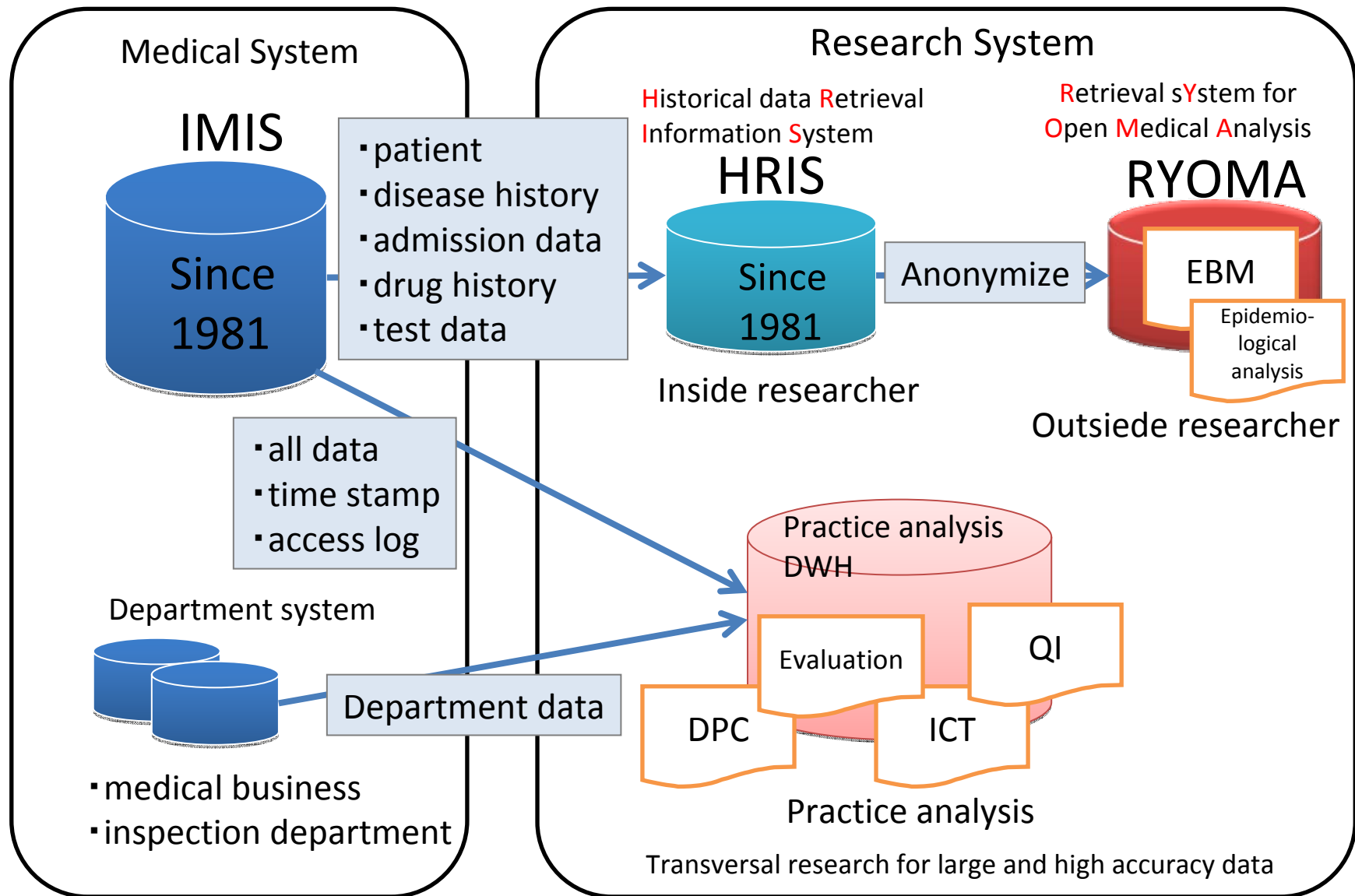


Fig.2 DWH system in Kochi Medical School Hospital

Process for anonymous data

- Anonymizeing for Patient ID
 - reversible mapping
- Change of date information (shifting)
 - Definition of changing date
- Data removal for few disease

Removal patient 

Patient ID	Anonymous ID	Shifting date
0000001	1234567890	5
0000002	X	X
0000003	0987654321	-3
...

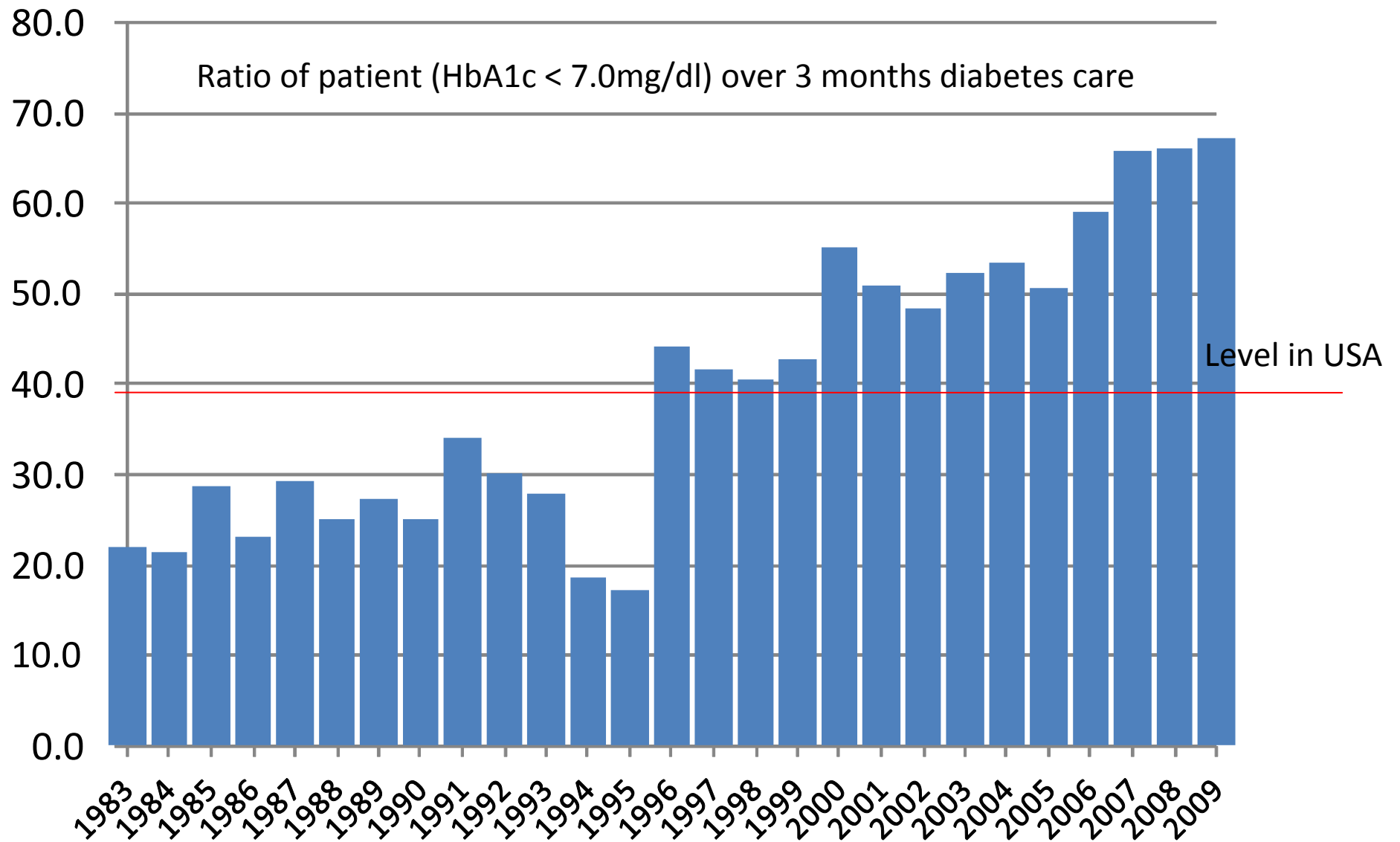
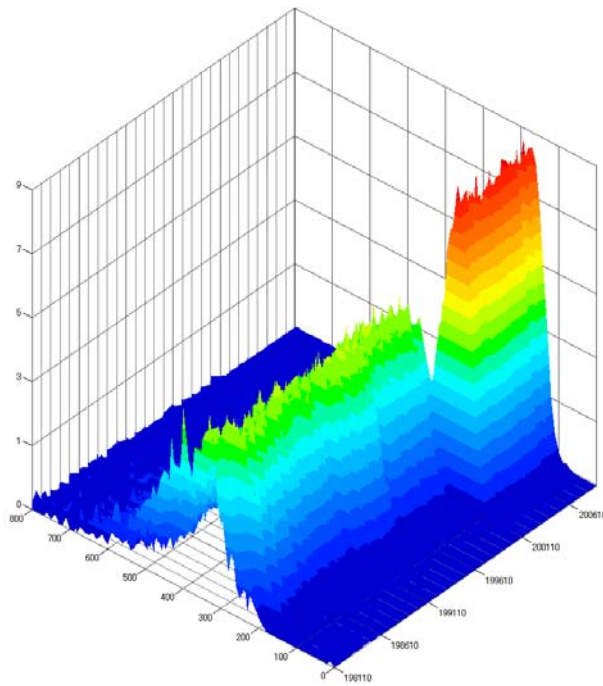
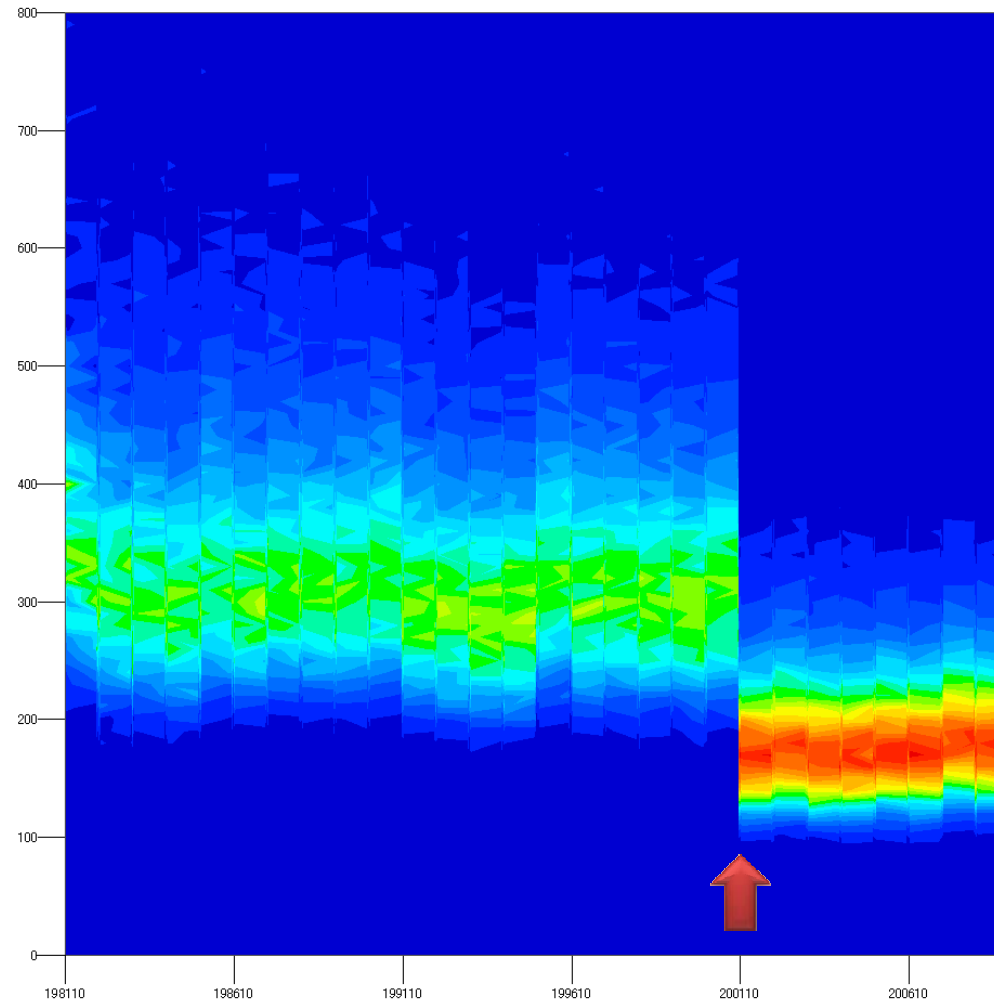


Fig.3. Ratio of control patient for diabetes care



Distribution of
lactase dehydrogenase (LD)
in 28 years
(distribution by year)



Change of measurement

2001/10/1

Fig.4. Standardization of test data in measurement change

Definition of coefficient of transformation based on data distribution

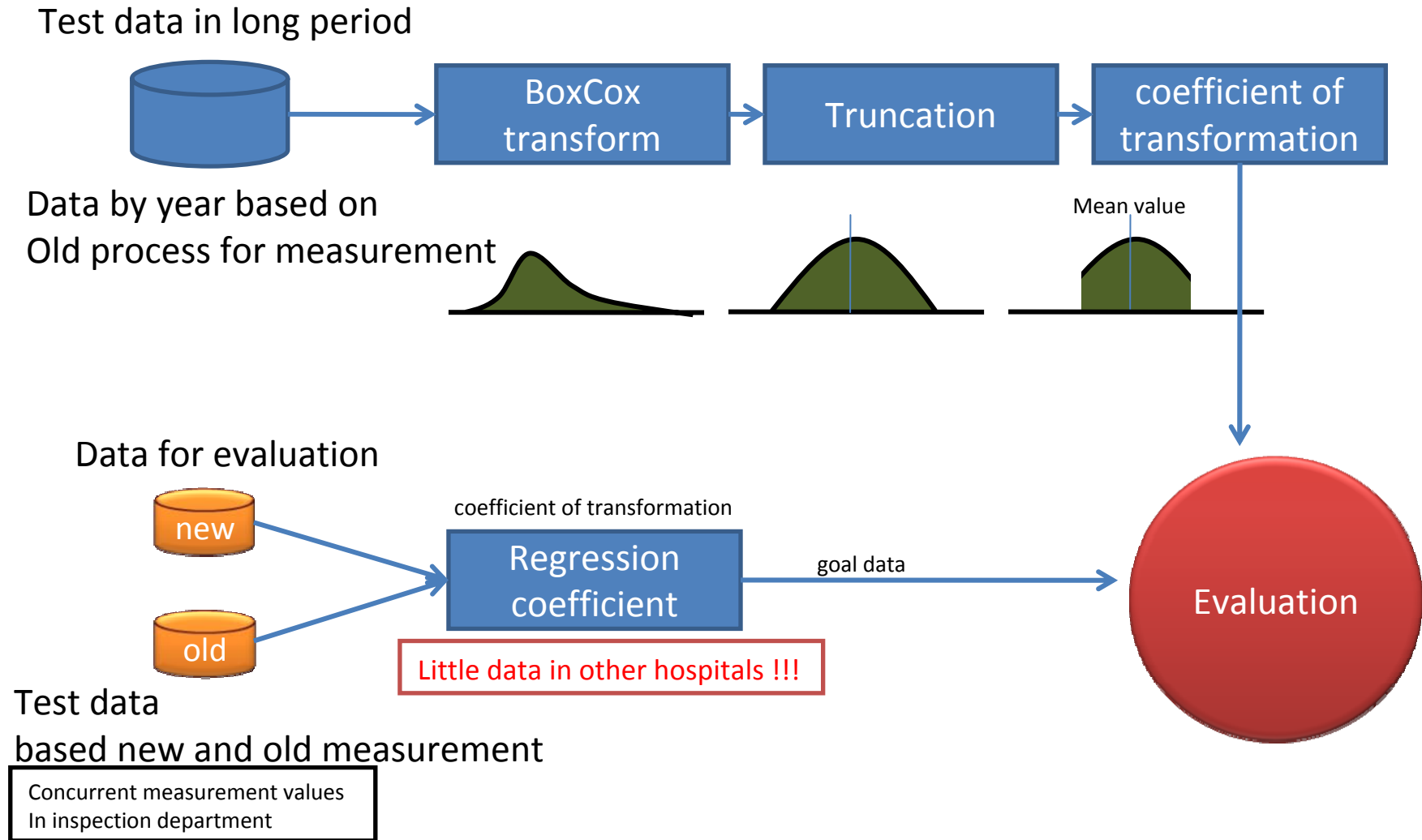


Fig.5. Proposal of normalization process

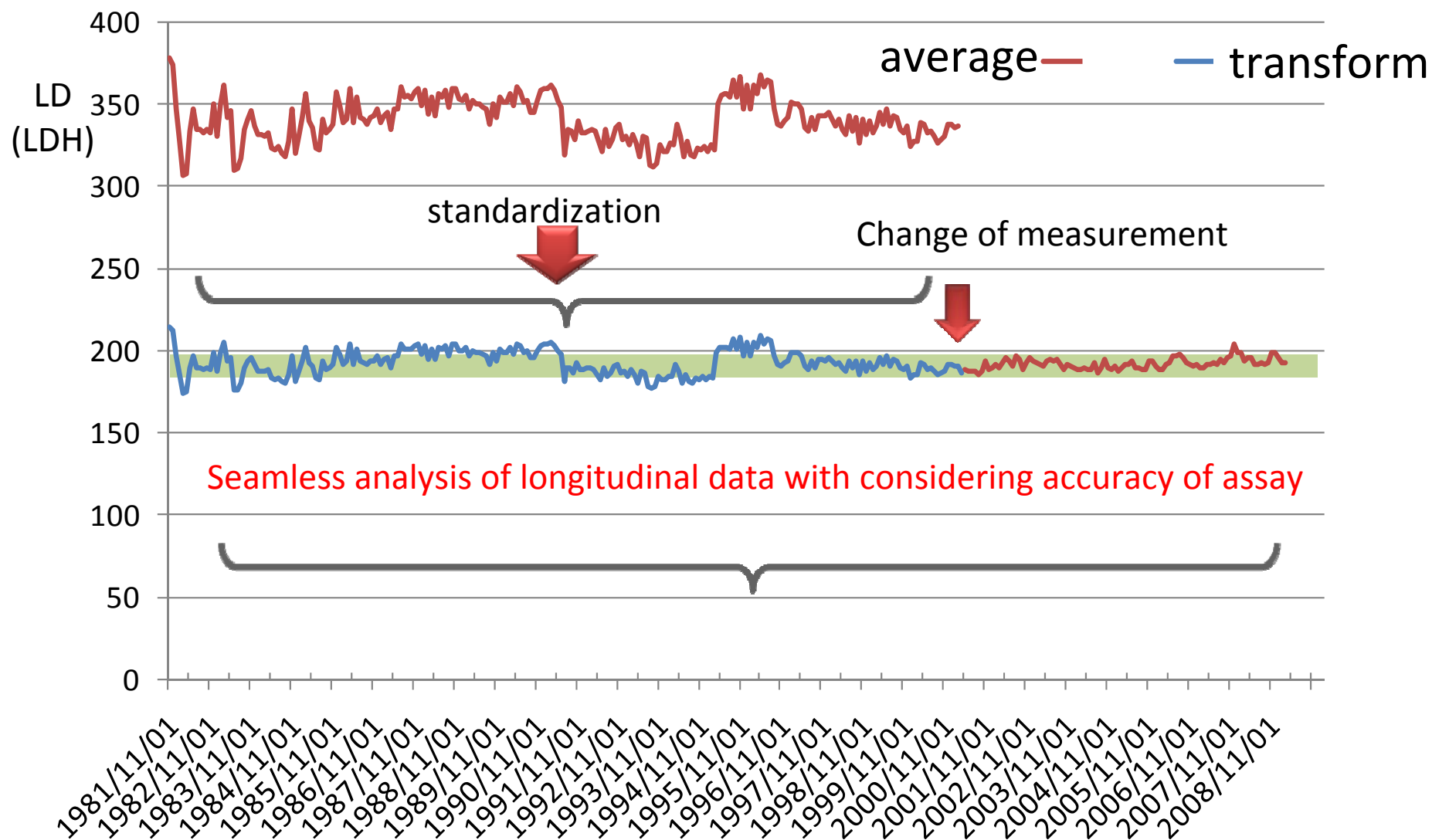


Fig.6. Sample of standardization result

5. Conclusion

- Infrastructure development for medical records
 - Kochi medical school hospital from 1981
- Secondary use
 - medical economics, estimation,...
- Data integration process with other hospitals
 - standardization
- Right management system of each medical data
 - Patients, hospitals, ...