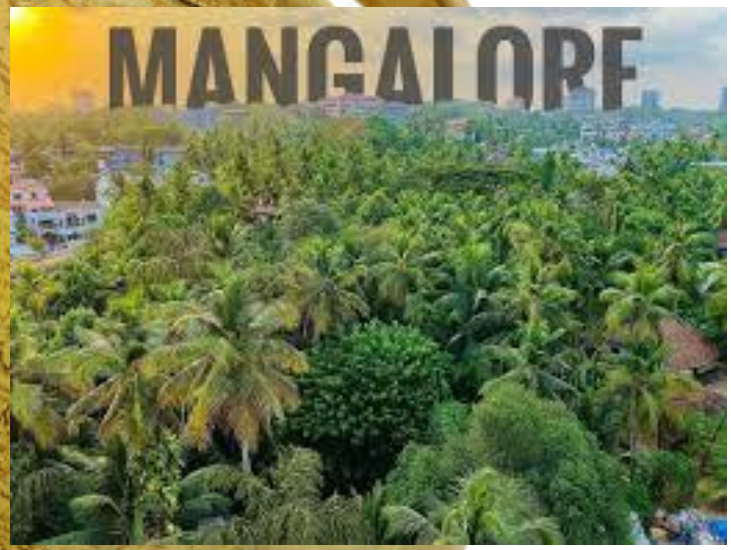
Dr. Machine Learning




Welcome To Silicon valley.....

Towards Mangalore…



St Aloysius Deemed to be University

St Aloysius College, Chapel

High School Block

St Aloysius College Chapel view

Konkani Institute, Museum

St Aloysius Deemed to be University

Clinical Machine Learning

Dr. S Ruban
Associate Professor & HOD
St Aloysius Deemed to be University



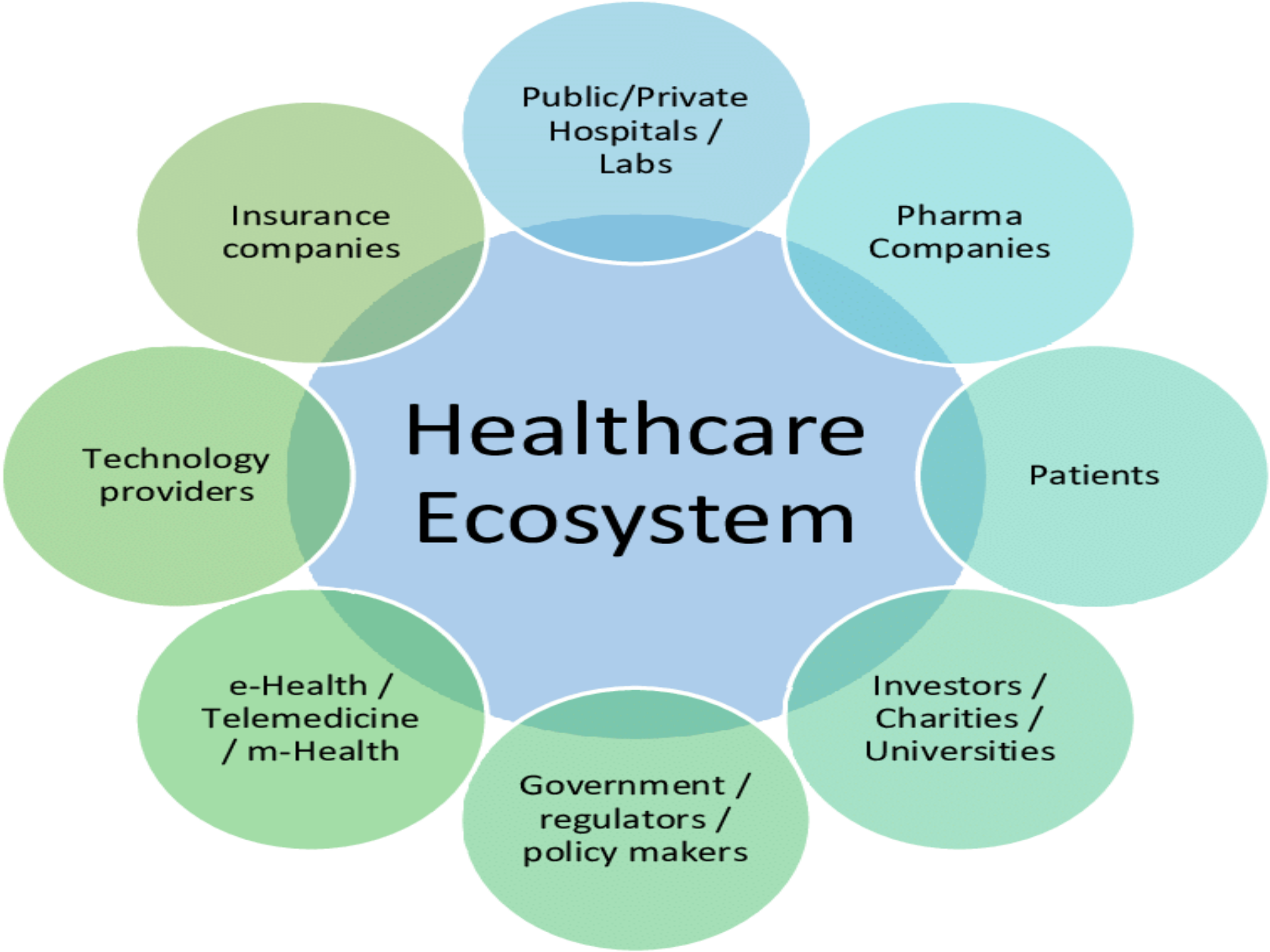

try pronouncing the COLOR instead of the WORD

BLUE GREEN YELLOW BLUE
RED BLACK BLUE
YELLOW BLUE RED GREEN
BLACK YELLOW GREEN

MACHINE LEARNING IN HEALTHCARE: FIELDS OF APPLICATION

- Diseases Identifications and Diagnosis
- Medical Imaging
- Drug Discovering and Manufacturing
- Personalized Medical Treatment
- Smart Health Records
- Diseases Prediction





Public/Private Hospitals / Labs
Pharma Companies
Patients
Investors / Charities / Universities
Government / regulators / policy makers
e-Health / Telemedicine / m-Health
Technology providers
Insurance companies
Healthcare Ecosystem

Is it different ?.....

- ✓ **Life or death decisions**
- ✓ **Need robust algorithms**
- ✓ **Heterogeneity of data**
- ✓ **Lack of qualified resources**
- ✓ **Transparency and Accountability**

For Reading : https://www.nature.com/articles/s41591-021-01614-0

Machine Learning in Medicine




VARIOUS TYPES OF HEALTHCARE DATA

S. No	Types of Data	Healthcare Data	Pre processing Steps to use Deep Learning	DL based Healthcare Applications
1	Numerical	Blood reports	Normalization of the data	Classification of normal/ abnormal
2	Categorical	Medical test results	Encoding	Classification of normal/ abnormal
3	Text	Medical reports	Word2Vec, TF/IDF, ELMO kind of word embeddings	Automatic Report generation, Summarizing medical report
4	Image	X-ray	Image Normalization,	Classification, Segmentation
5	Video	CT, MRI, Ultrasound output	Slices/frames, image level preprocessing	Classification, Segmentation and object detection
6	Speech	Doctors and technicians discussions and instructions	Speech to text conversion	Capturing speech and generate report
7	Signals	ECG, EMG signals	Signals to vectors conversion	Classification of normal/ abnormal

Moving Ahead



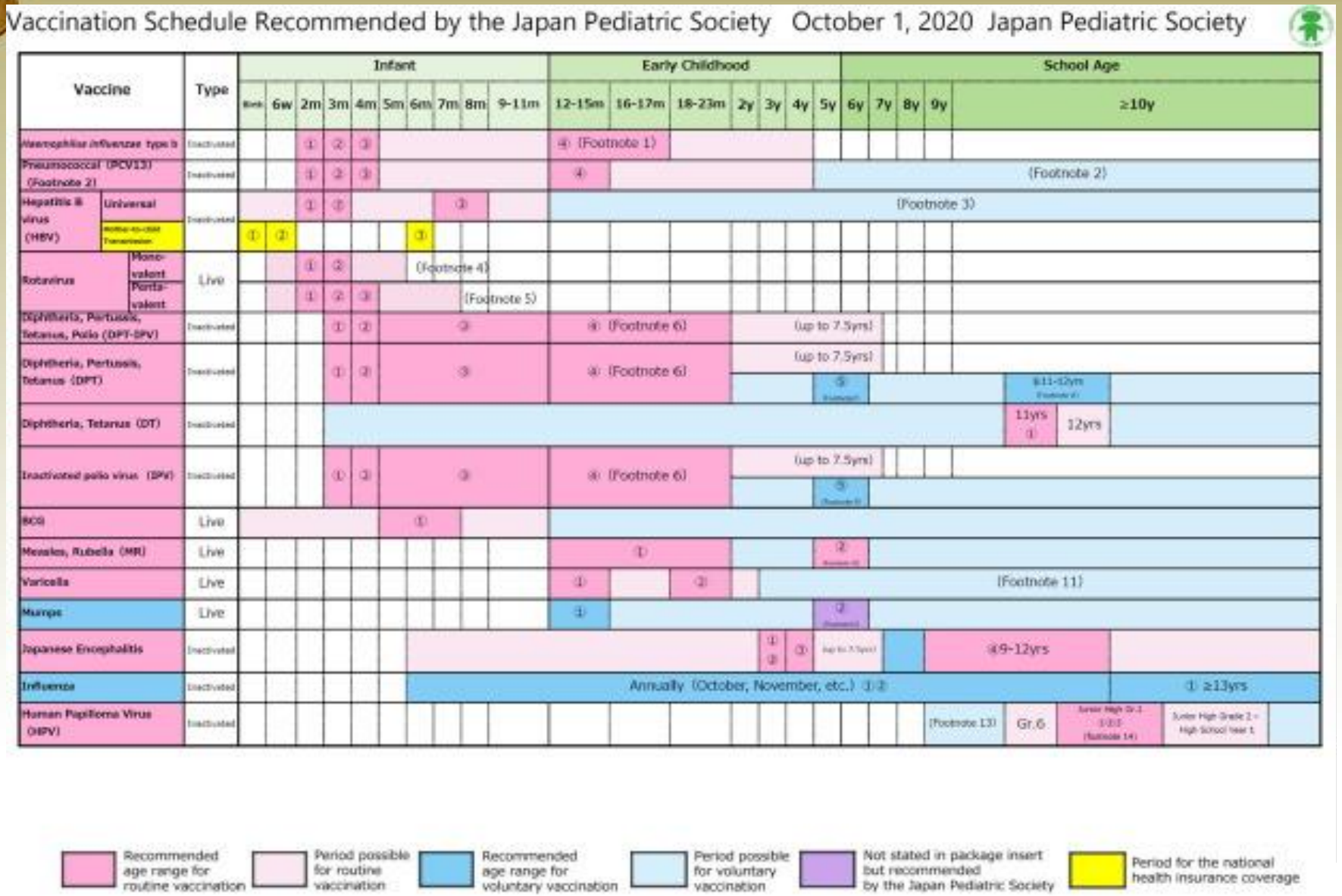

Case Study 1: Immunization Tracker (1/2)

Identifying children who will default from vaccine

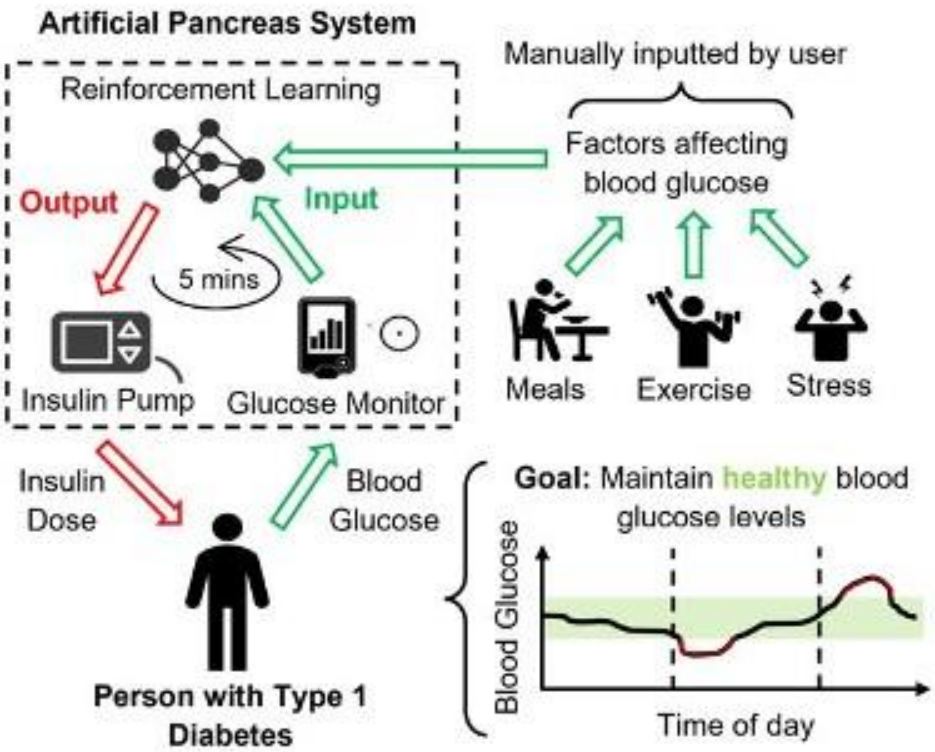
Vaccine Recommendation in Japan

WHO recommendation for delayed vaccine

Case Study 1: Immunization Tracker (2/2)



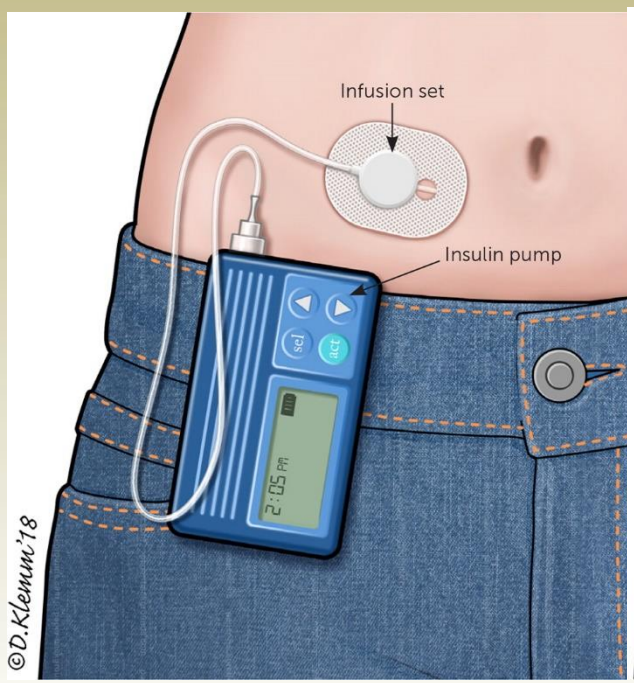
Case Study 2: Type 1 Diabetics Management (1/4)



Machine Learning in Diabetes Care

Prediction for those having Type 1 Diabetes

Case Study 2: Type 1 Diabetics Management (2/4)



Case Study 2: Type 1 Diabetics Management (3/4)

Sensor Applicator

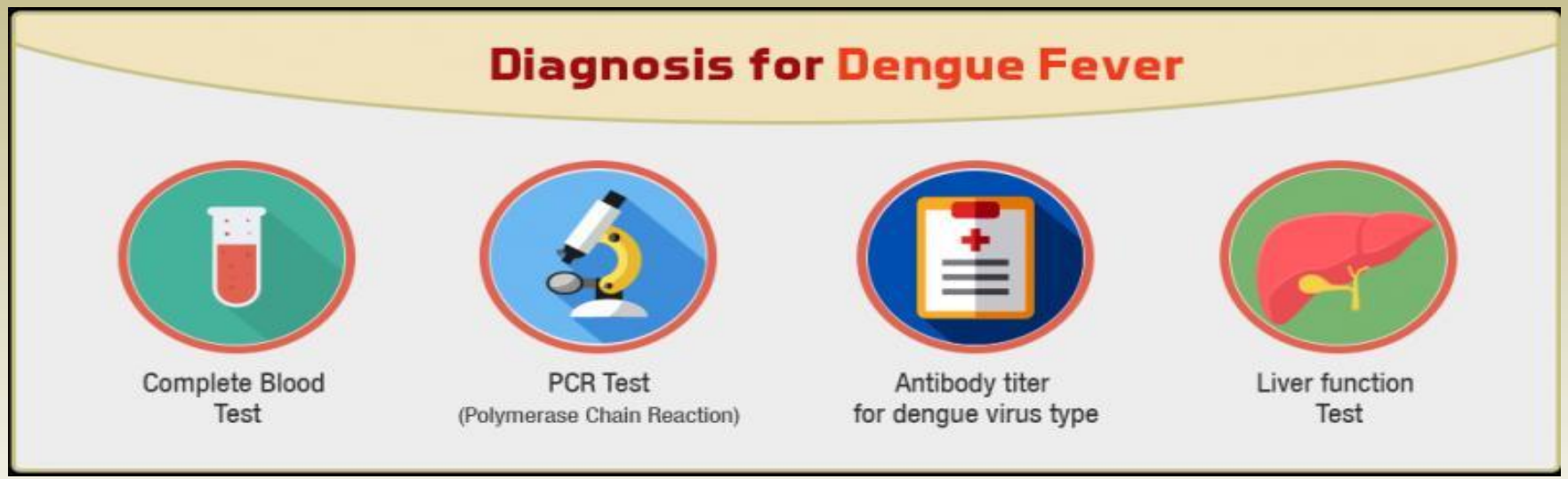
Sensor Pack

Sensor (assembled)

Reader

Case Study 2: Type 1 Diabetics Management (4/4)

Case Study 3: Noninvasive Dengue Fever detection (1/3)

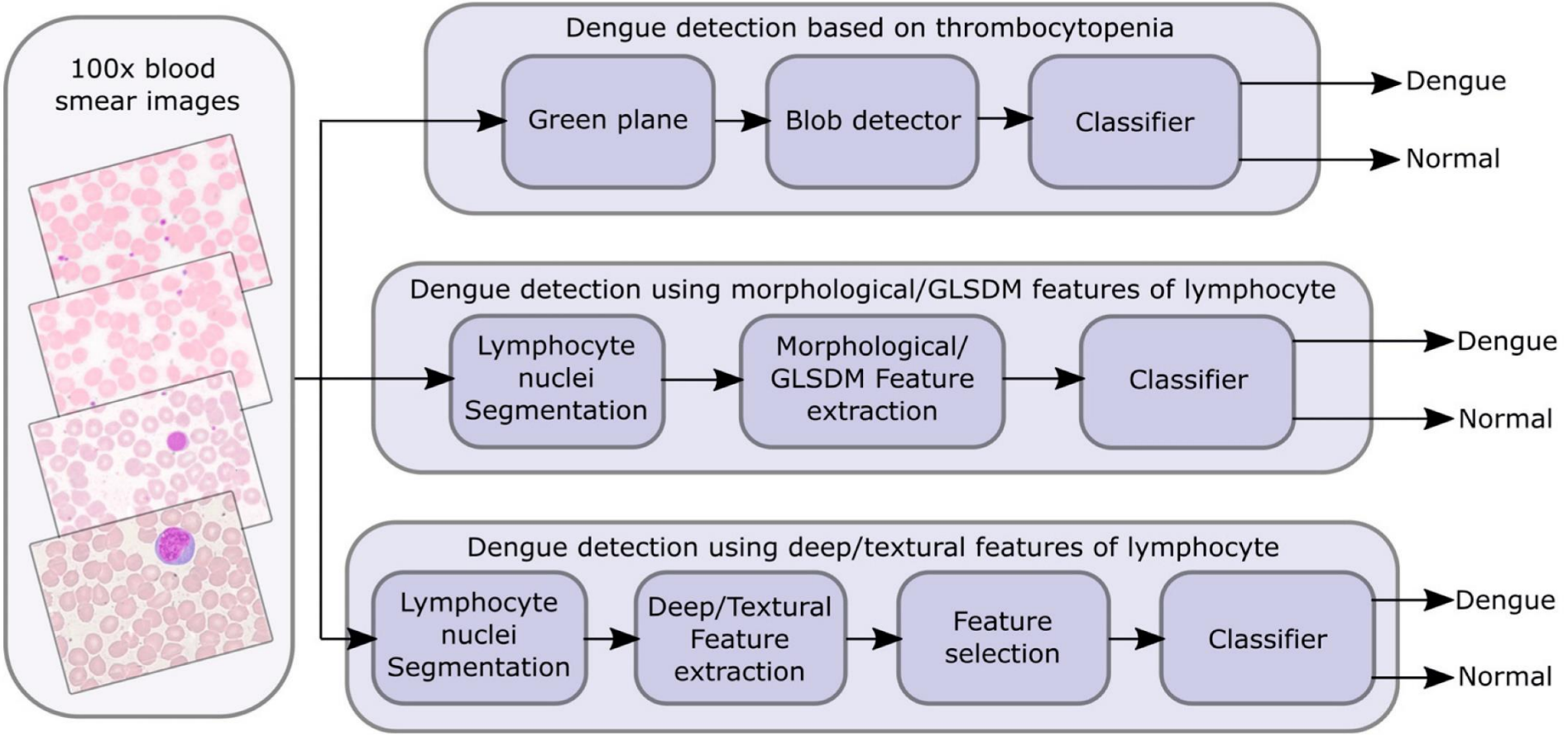


Platelet prediction in Dengue patients

Dengue Detection using Ensemble algorithms




Impact of Technology (2/3)






Impact of Technology (3/3)

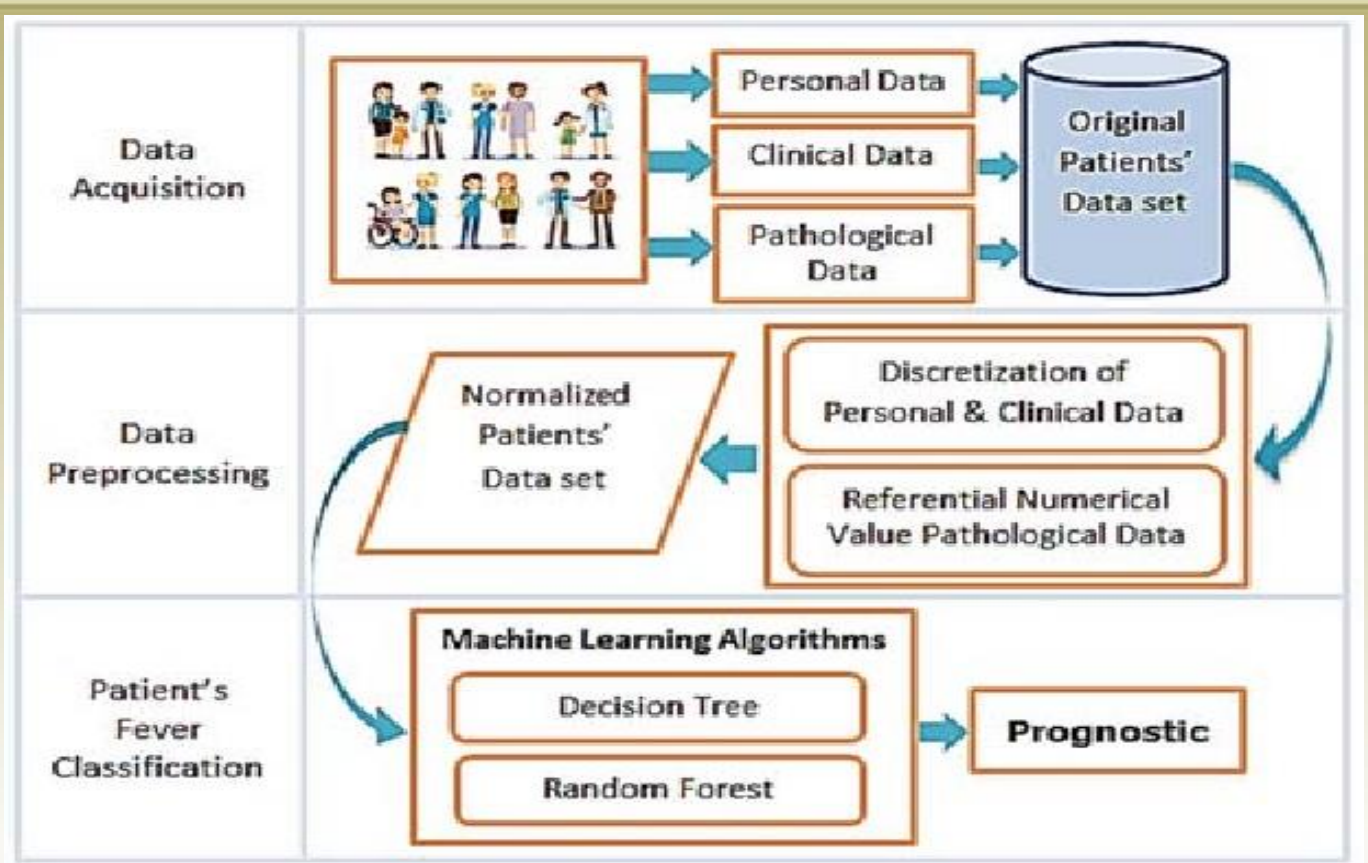


Fig. 1. Flow chart of dengue prediction Model

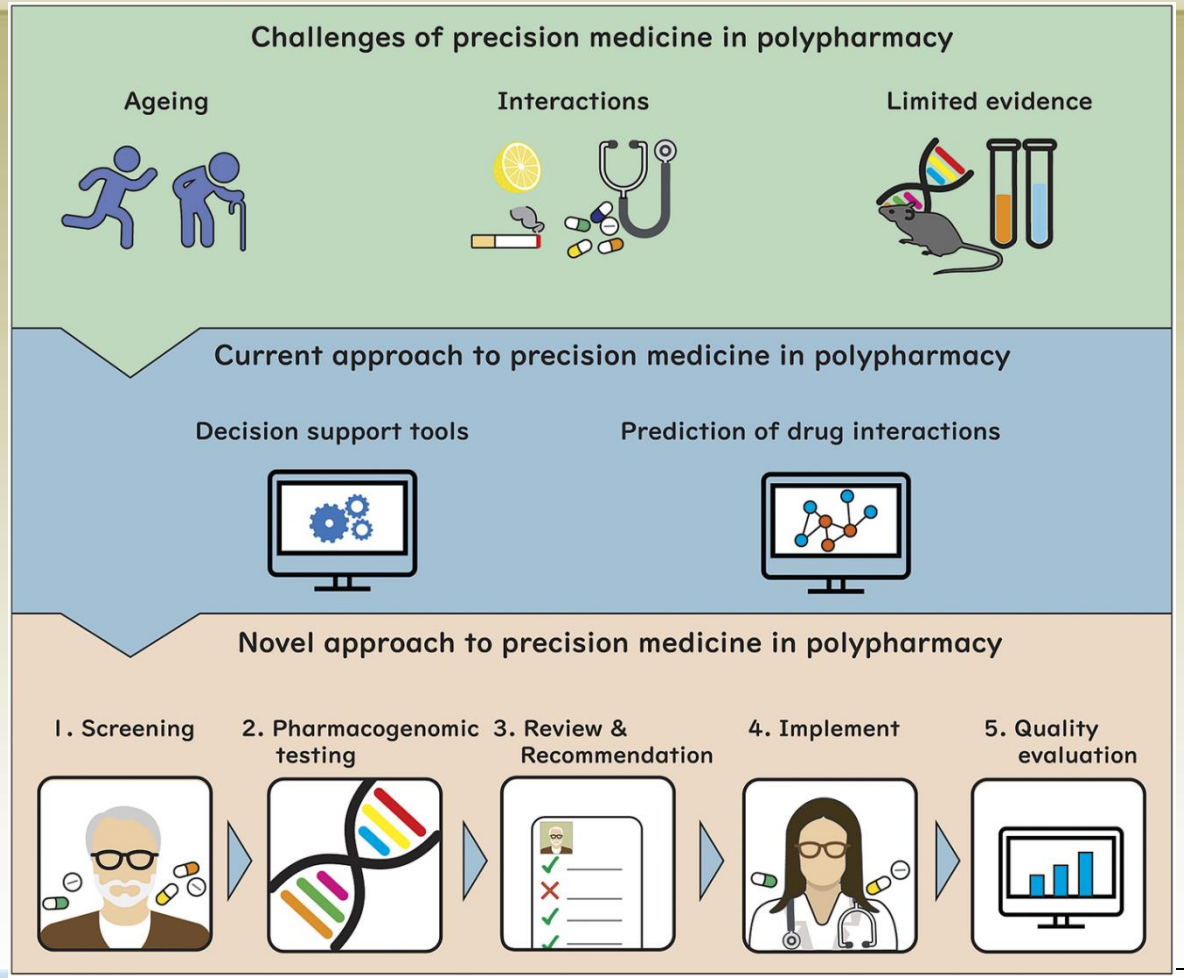
Case Study 4: Poly Pharmacy (1/3)

Exploring Polypharmacy

poly pharmacy in saudi Arabia

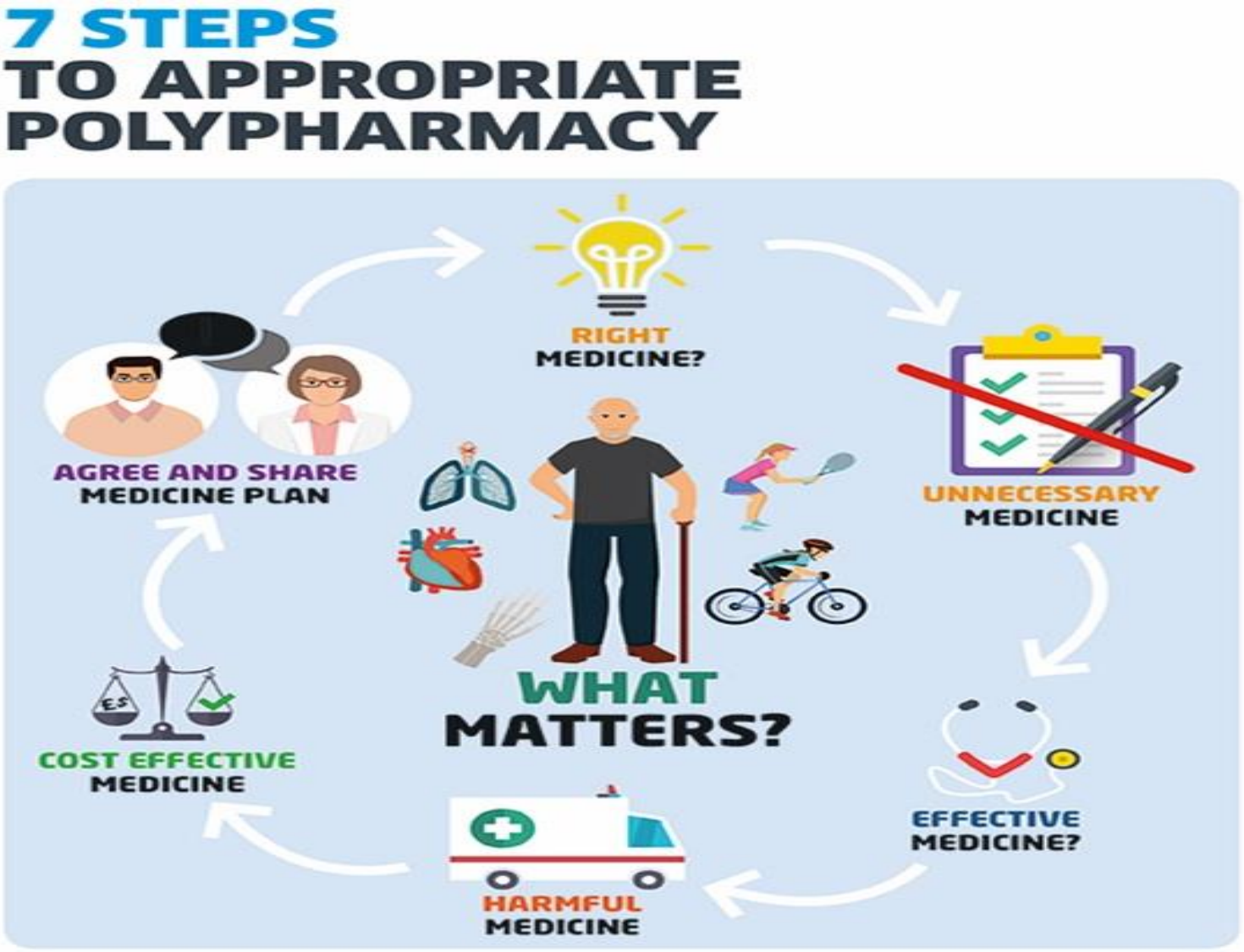



Case Study 4: Poly Pharmacy (2/3)





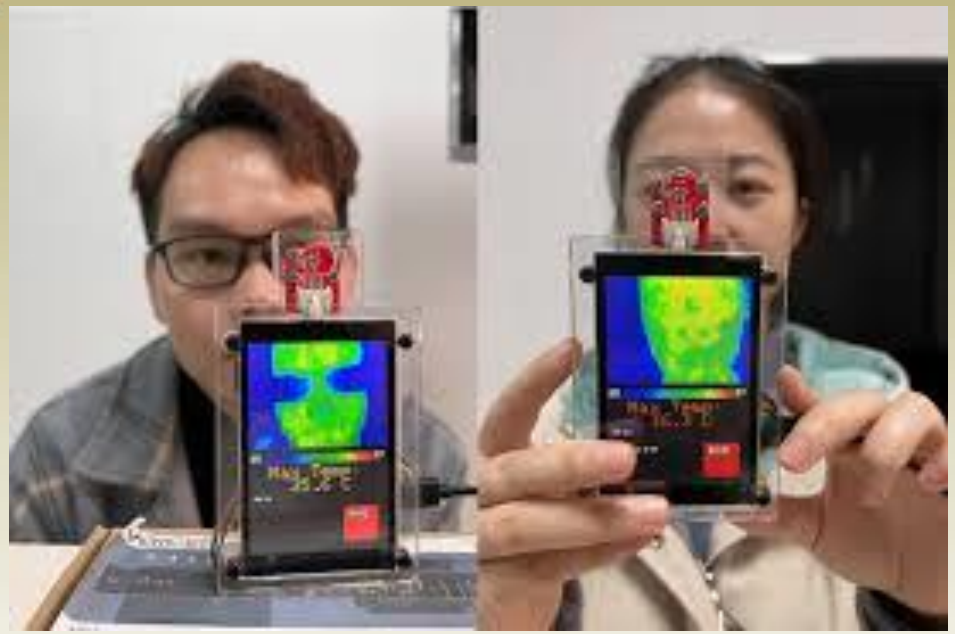

Case Study 4: Poly Pharmacy (3/3)



Case Study 5: Thermal Imaging to identify Snakebite (1/2)




Case Study 5: Thermal Imaging to identify Snakebite (2/2)



Snake bite

Venomous Animal Bites

Let’s Discuss……




What Next ……

School of Information Science & Technology

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