Slide 1:

Homework 01

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Slide 2:

Data

**Chart Information**

Patient demographics (e.g. age, gender, race, ethnicity, contact information)

Medical encounters (e.g. initial consultations, follow-up visits, procedures)

Developmental history (e.g. growth charts, developmental milestones)

Current and past medications

Medication, food, and other allergies

Active problems/diagnoses

History of present illness (HPI)

Physical examination (including vital signs)

Results of medical tests and imaging studies

**Patient History**

History of present illness (HPI)

Past medical history (PMH)

Past surgical history (PSH), including surgery dates and reports

Family history (e.g. history of certain conditions or diseases in family members)

Social history (e.g. occupation, family situation, habits such as smoking or exercise)

Immunizations and dates

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Slide 3:

Data Sources & Types

**Demographic Data:** U.S. Census Bureau data, EHRs

**Medical Data:** Healthcare Cost and Utilization Project (HCUP) data, clinical trial data, CPT codes from the AMA, EHRs

**Patient History Data:** EHRs, medical claims data, health questionnaires

**Social Determinants of Health Data:** NACCHO resources, WHO definitions

**Patient-Generated Data:** FDA guidance on digital health technologies, PCHA resources

**Public Health Data:** CDC data on infectious diseases, chronic diseases, and injury, WHO data on health equity, non-communicable diseases, and environmental health

**Demographic Data:**

Census: CSV, JSON, Excel

EHRs: HL7, XML, FHIR

**Medical Data:**

HCUP: CSV, SAS, Excel

Clinical Trials: CDISC, CSV, XML

CPT Codes: CSV, Excel

EHRs: HL7, XML, FHIR

**Patient History Data:**

EHRs: HL7, XML, FHIR

Claims: X12, CSV, Excel

Questionnaires: CSV, Excel, PDF

**Social Determinants:**

NACCHO: CSV, Excel, PDF, GIS

WHO: CSV, Excel, XML, JSON

**Patient-Generated Data:**

FDA: PDF, HTML

PCHA: PDF, HTML, XML, JSON

**Public Health Data:**

CDC: CSV, Excel, JSON, GIS

WHO: CSV, Excel, XML, JSON, GIS

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Slide 4:

**Descriptive Analytics**

Analyze patient demographics and disease prevalence to understand the population's health status. (**Frequency**: Monthly)

Evaluate hospital admission and discharge rates, lengths of stay, and readmission rates. (**Frequency**: Monthly)

Analyze treatment patterns and medication usage to identify best practices. (**Frequency**: Monthly)

**Diagnostic Analytics**

Identify patterns and correlations between patient characteristics and health outcomes. (**Frequency**: On Demand)

Analyze data to determine factors contributing to hospital readmissions or complications. (**Frequency**: Monthly)

Investigate the causes of variations in treatment outcomes and care quality. (**Frequency**: Monthly)

**Predictive Analytics**

Develop models to predict disease progression or patient risk based on clinical and demographic factors. (**Frequency**: Yearly)

Forecast healthcare resource utilization, such as hospital bed or staff requirements. (**Frequency**: Weekly)

Predict patient adherence to treatment plans or the likelihood of no-show appointments. (**Frequency**: Yearly)

**Prescriptive Analytics**

Recommend personalized treatment plans based on patient-specific factors and historical data. (**Frequency**: On Demand)

Optimize resource allocation, such as staff scheduling or patient triage, to improve care quality and efficiency. (**Frequency**: Weekly)

Suggest interventions to improve patient outcomes and prevent complications or readmissions. (**Frequency**: Yearly)

Slide 5:

Cloud Services

**Data Ingestion:**

**Data Storage and Data Processing:**

**Data Warehousing and BI:**

**Business Intelligence and Analytics:**

**Data Science – ML/AI:**

**Applications – Webapps, Mobile:**