### **Disease Transactional Model Design for Global Health Tracking**

Based on the TB database structure , Heres a more comprehensive Disease Transactional Model for tracking global health

* **Disease**: Represents specific medical conditions or illnesses being tracked.
* **Patient**: Represents individuals diagnosed with or at risk of diseases.
* **Location**: Represents geographical areas where diseases occur or patients reside.
* **Medication**: Represents drugs or treatments used to combat diseases.
* **ClinicalTrial**: Represents research studies conducted to test new treatments or interventions.
* **HealthcareProvider**: Represents medical professionals involved in patient care and disease management.
* **Symptom**: Represents observable indicators of diseases.
* **RiskFactor**: Represents conditions or behaviors that may increase the likelihood of developing a disease.

***Here are the relationships between the entities:*** The many-to-many (⇄) and many-to-one (→) symbols indicate the cardinality of each relationship.

**Disease** ⇄ **Patient** (many-to-many)

* A patient can be diagnosed with multiple diseases
* A disease can affect multiple patients

**Disease** ⇄ **Symptom** (many-to-many)

* A disease can have multiple symptoms
* A symptom can be associated with multiple diseases

**Disease** ⇄ **ClinicalTrial** (many-to-many)

* A disease can be studied in multiple clinical trials
* A clinical trial can investigate multiple diseases

**Disease** ⇄ **Medication** (many-to-many)

* A disease can be treated by multiple medications
* A medication can treat multiple diseases

**Patient** → **RiskFactor** (many-to-many)

* A patient can have multiple risk factors
* A risk factor can apply to multiple patients

**Patient** → **Location** (many-to-one)

* A patient resides in one location
* A location can have multiple patients

**ClinicalTrial** → **HealthcareProvider** (many-to-one)

* A clinical trial is conducted at one healthcare facility
* A healthcare facility can host multiple clinical trials

**HealthcareProvider** → **Location** (many-to-one)

* A healthcare provider works at one location
* A location can have multiple healthcare providers

**Medication** ⇄ **ClinicalTrial** (many-to-many)

* A medication can be tested in multiple clinical trials
* A clinical trial can test multiple medications

**Identifing Attributes:**

**Disease:**

DiseaseID (Primary Key)

Name

Classification

SeverityLevel (e.g., Mild, Moderate, Severe)

ModeOfTransmission (e.g., Airborne, Bloodborne, Vectorborne)

IncubationPeriod (in days)

ContagiousPeriod (in days)

**Patient:**

PatientID (Primary Key)

FirstName

LastName

Gender

DateOfBirth

LocationID (Foreign Key to Location)

DateOfDiagnosis

DateOfRecovery

Status (e.g., In treatment, Recovered, Deceased)

**RiskFactor:**

RiskFactorID (Primary Key)

Name

Description

**ClinicalTrial:**

ClinicalTrialID (Primary Key)

DiseaseID (Foreign Key to Disease)

Name

StartDate

EndDate

TrialPhase (e.g., Phase 1, Phase 2, Phase 3)

LeadResearcher

ProviderID (Foreign Key to HealthcareProvider)

**Medication:**

MedicationID (Primary Key)

Name

Manufacturer

DosageInformation

SideEffects

ApprovalStatus (e.g., Approved, In Review, Rejected)

**HealthcareProvider:**

ProviderID (Primary Key)

FirstName

LastName

Specialty

LicenseNumber

LocationID (Foreign Key to Location)

**Symptom:**

SymptomID (Primary Key)

DiseaseID (Foreign Key to Disease)

Name

Description

**Location:**

LocationID (Primary Key)

Country

Region

City

Latitude

Longitude

#### **Assigning Entity Identifiers:**

Each entity is assigned a unique identifier as the primary key to uniquely distinguish each record within that entity. Like DiseaseID for Disease, PatientID for Patient, and so on.

#### **TheUse Standard and Consistent Naming:**

* Used CamelCase for entity names and attributes (e.g., PatientID, DiseaseID).
* Used clear and descriptive names for attributes, avoiding abbreviations unless universally recognized.
* Included prefixes like ID for identifiers (e.g., CountryID).

