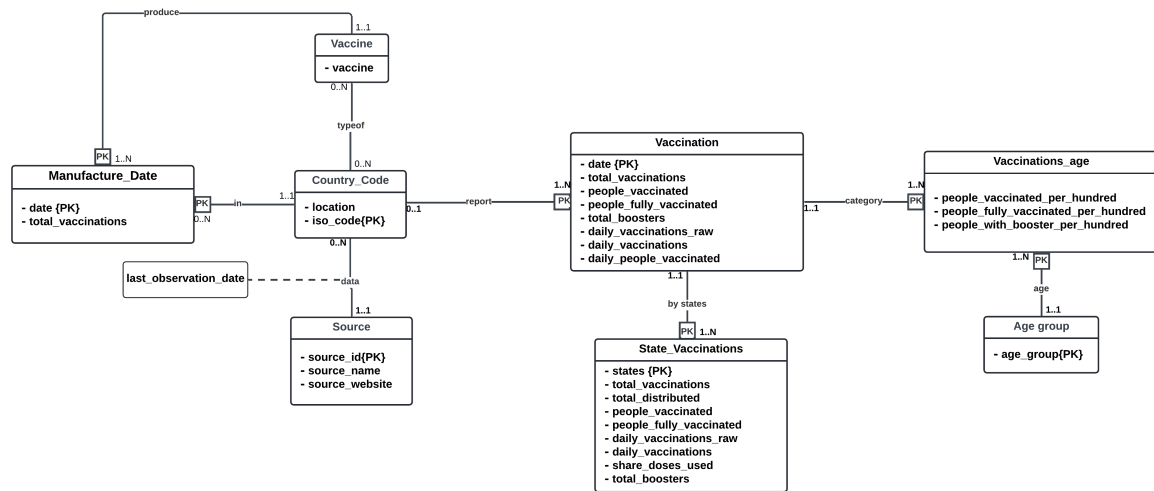


# ISYS1055 - Database Design Project

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## Part B: Designing the Database

### ER diagram:



### Assumption:

- *per\_hundred* and *per\_million* attribute can be identified in the runtime and hence it is redundant
- Using *iso\_code* as the key to identify the location thus creating as an entity which reduce anomalies
- Age group is created as an entity and all the age group classification happens same categories.
- Last\_observation\_date is invoked between vaccine and iso\_code
- Considering per hundred in vaccination-by-age-group entity as no data is given with respect to actual number for segregation by age
- No state information is given except us\_state\_vaccination and the data of states cannot be derived from vaccination hence new entity with same attribute as vaccination per states
- Not all country in **Vaccination** entity is been observed in **Observation** entity

- Not all the country is have source

### Normalisation Challenge:

- *location* → *iso\_code*, *source\_name* → *source\_website* hence separated it to a strong entity
- *age\_group* is redundant and might cause anomalies hence separated as a strong entity
- vaccination by country is a redundant information which can be derived from vaccination entity and removed.
- All the entity are dependent on *location* or *dates* hence made a weak entity.
- Auto increment *source\_id* as same source name have different *source\_website*
- Not all country in **Vaccination** entity is been observed in **Observation** entity
- Certain vaccine are not in *manufacture\_date* entity and are available in vaccination
- “2023-05-10” is in *state\_vaccination* but not in vaccination table thus new entry is created.

### Database schema

#### 1. Strong entity

1. **Age\_group**(age\_group)
2. **Vaccine**(vaccine)
3. **Country**(iso\_code, location)
4. **Source**(source\_id, source\_name, source\_website)

#### 2. Weak entity

1. **Manufacture\_date**(iso\_code\*, date, vaccine\*, total\_vaccinations)
2. **Vaccination**(iso\_code, date, total\_vaccinations, people\_vaccinated, people\_fully\_vaccinated, total\_booster, daily\_vaccination\_raw, daily\_vaccination, daily\_people\_vaccinated)
3. **State\_Vaccinations**(iso\_code\*, date\*, states, total\_vaccinations, total\_distributed, people\_vaccinated, people\_fully\_vaccinated, daily\_vaccination\_raw, daily\_vaccinations, share\_doses\_used, total\_boosters)

4. **Vaccination\_age**(iso\_code\*, date\*, age\_group\*, people\_vaccinated\_per\_hundred, people\_fully\_vaccinated\_per\_hundred, people\_with\_booster\_per\_hundred)
3. **One-One relationship:-** No 1-1 relationship between entity
4. **One-Many relationship:-**
  1. **Country**(iso\_code\*, location, source\_id\*, last\_observation\_date)
5. **Many-Many relationship:-**
  1. **CountryVaccine**(iso\_code\*, vaccine\*)
6. **Multivalued attribute:-** No multivalued attribute as the vaccine type itself is created as an strong entity
7. **Degree of relationship:-** There is no degree of relationship exist

#### **Final Schema:**

- **CountryVaccine**(iso\_code\*, vaccine\*)
- **Country**(iso\_code\*, location, source\_id\*, last\_observation\_date)
- **Manufacture\_date**(iso\_code\*, date, vaccine\*, total\_vaccinations)
- **Vaccination**(iso\_code, date, total\_vaccinations, people\_vaccinated, people\_fully\_vaccinated, total\_booster, daily\_vaccination\_raw, daily\_vaccination, daily\_people\_vaccinated)
- **State\_Vaccinations**(iso\_code\*, date\*, states, total\_vaccinations, total\_distributed, people\_vaccinated, people\_fully\_vaccinated, daily\_vaccination\_raw, daily\_vaccinations, share\_doses\_used, total\_boosters)
- **Vaccination\_age**(iso\_code\*, date\*, age\_group\*, people\_vaccinated\_per\_hundred, people\_fully\_vaccinated\_per\_hundred, people\_with\_booster\_per\_hundred)
- **Age\_group**(age\_group)
- **Vaccine**(vaccine)
- **Source**(source\_id, source\_name, source\_website)