ISYS1055/3412 (Practical) Database Concepts

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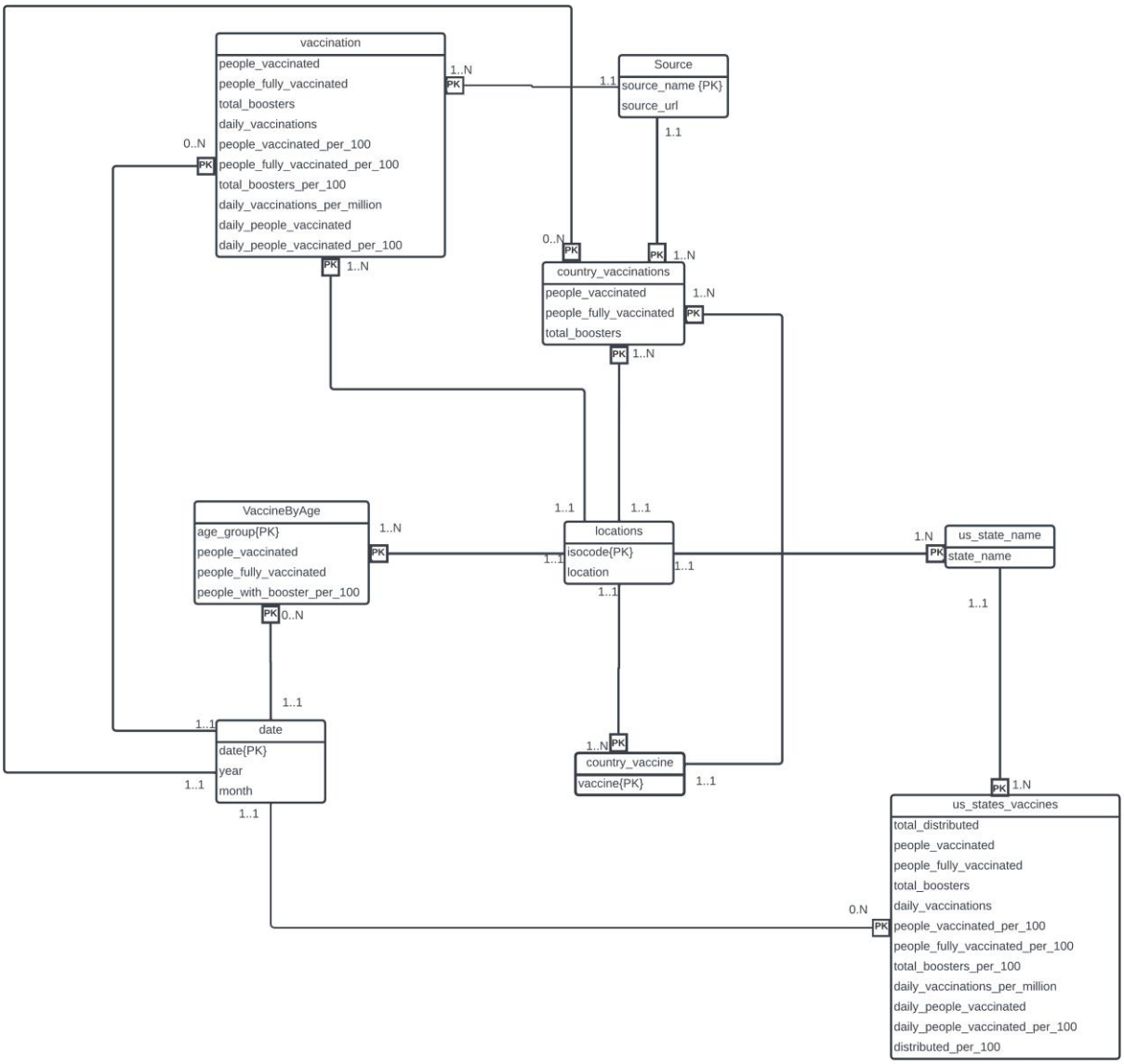
ER Diagram:



NORMALISATION:

1. locations (iso_code, location , vaccine[1..N], last_observation_date, source_name, source_url): 0NF

- Its in 0NF because the attribute vaccine is multivalued.

country_vaccine (iso_code ,vaccine) : 3NF

2. locations(iso_code, location, date, source_name, source_url) : 2NF

- The source_url is dependant only on source_name and it does not need iso_code to be derived.

Source (source_name, source_url) : 3NF

locations(iso_code, location) : 3NF

date (date, year, month) : 3NF

3. Vaccination(iso_code*,date*,people_vaccinated,people_fully_vaccinated,total_boosters,daily_vaccinations,people_vaccinated_per_100,people_fully_vaccinated_per_100,total_boosters_per_100,daily_vaccinations_per_million,daily_people_vaccinated,daily_people_vaccinated_per_100) : 3NF

- Here all the attributes depend on the composite primary key (iso_code, date).

4. country_vaccinations(iso_code*, date*, vaccine*, source_name, people_vaccinated, people_fully_vaccinated, total_boosters) : 3NF

- country_vaccinations table has all the data of daily observations of vaccinations of Australia, England, New Zealand and United States. All these csv are combined as they had the same attributes and it helps us to do reduce redundancy in our database.

5. Vaccination_by_manufacturer (iso_code*, date*, vaccine*, total_vaccinations) : 3NF

- As country_vaccinations and Vaccination_by_manufacturer had the same primary keys , both the entities should be merged and to form one entity. So the data from the Vaccination_by_manufacturer has been merged into country_vaccinations. As we know total_vaccinations is derived from the addition of (people_vaccianted+ people_fully_vaccinated+total_boosters). The total vaccinations column in Vaccination_by_manufacturer has been derived in the above way.

6. Vaccinations-by-age-group (location, date, age, people_vaccinated_per_100, people_fully_vaccinated_per_100, people_with_booster_per_100)

VaccinebyAge (iso_code*, date*, age_group, people_vaccinated_per_100, people_fully_vaccinated_per_100, people_with_booster_per_100) : 3NF

- Here the location attribute is replaced by iso_code. As iso_code -> location.

7. Us_state_vaccines(iso_code*,state_name*,date*,total_distributed,people_vaccinated,people_fully_vaccinated_per_100,people_fully_vaccinated,people_vaccinated_per_100,distributed_per_100,daily_vaccinations,daily_vaccinations_per_million,share_doses_used,total_boosters,total_boosters_per_100) : 3NF
8. us_state_name(iso_code*, state_name) : 3NF

- Also I have introduced “us_state_name” which has USA as a iso_code. This is later borrowed in Us_State_vaccines.

Final Schema:

country_vaccine (iso_code ,vaccine)

locations(iso_code, location)

Source (source_name, source_url)

date (date, year, month)

country_vaccinations(iso_code*, date*, vaccine*, source_name, people_vaccinated, people_fully_vaccinated, total_boosters)

Vaccination(iso_code*,date*,people_vaccinated,people_fully_vaccinated,total_boosters,daily_vaccinations,people_vaccinated_per_100,people_fully_vaccinated_per_100,total_boosters_per_100,daily_vaccinations_per_million,daily_people_vaccinated,daily_people_vaccinated_per_100)

VaccinebyAge (iso_code*, date*, age_group, people_vaccinated_per_100, people_fully_vaccinated_per_100, people_with_booster_per_100)

Us_state_vaccines(iso_code*,state_name*,date*,total_distributed,people_vaccinated,people_fully_vaccinated_per_100,people_fully_vaccinated,people_vaccinated_per_100,distributed_per_100,daily_vaccinations,daily_vaccinations_per_million,share_doses_used,total_boosters,total_boosters_per_100)

us_state_name(iso_code*, state_name)

References

‘covid-19-data/public/data/vaccinations at master · owid/covid-19-data’ *GitHub*, viewed 30 May 2023, <https://github.com/owid/covid-19-data>.

‘Different Types of SQL Functions’, viewed 11 June 2023, <https://www.tutorialspoint.com/different-types-of-sql-functions>.

‘SQL PARTITION BY Clause - Learn How To Use PARTITION BY in SQL’ *SQL Tutorial*.

‘SQL Server ROW_NUMBER() Function Explained By Practical Examples’ *SQL Server Tutorial*.

‘SQL Server COALESCE() Function’, viewed 11 June 2023 <https://www.w3schools.com/sql/func_sqlserver_coalesce.asp>.