

Study on the Adverse Effect of Covid-19 Vaccine

Capstone Project 3
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Problem Statement

The U.S. Department of Health and Human Services (HSS) is interested to know the demographic of the candidates who have adverse effects and common symptoms after the Covid-19 vaccination.





US: COVID-19 Vaccine Rollout Recommendations

From 3 Dec 20: Healthcare
personnel and residents of long-
term care facilities

From 22 Dec 20: Frontline
essential workers, people aged 65
years and older, people aged 16-
64 years with underlying medical
conditions and other essential
workers

Data Cleaning & Preparation

- Remove unwanted columns.
- **State:** Insert 'Unknown' into empty cells.
- **Age:** Age Yrs with values remain while null value to be replace with (Cage:Calculated age) Yrs.

1 ² ₃ VAERS_ID	A ^B _C STATE	1.2 AGE_YRS	1 ² ₃ CAGE_YR
918204	OH	27	27
918205		44	44
918206	MA	30	30
918207	FL	null	54
918208	IN	62	62
918209	VA	52	52
918210	VA	31	31

Data Cleaning & Preparation

- Recovered:** Insert empty cells and replace 'U' with 'Unknown'. Replace 'Y' with 'Yes', create conditional with Died column for those who have died become 'Death' while the others 'N' will be 'No'.

A ^B _C Hospitalisation	1 ² ₃ Days in Hospital	A ^B _C Recovered
Y		1 N
		null Y
Y		null
Y		2 N
		null N
		null N
Y		3 U

Data Cleaning & Preparation

- **Hospital Days:** Create a Conditional Column for the empty row
- If hospitalisation is 'No', then '0'.
- If hospitalisation is 'Yes' and Recovered is 'Unknown', 'Yes' and 'Death', then Hospital Days is 'Unknown'.
- If hospitalisation is 'Yes' and Recovered is 'No', then Hospital Days is 'In Progress'.

A ^B _C Recovered	A ^B _C Hospitalisation	A ^B _C Days in Hospital	A ^B _C Hospital Days
Unknown	Yes	nan	Unknown
No	No	null	0
Yes	Yes	null	Unknown
Unknown	Yes	1	1
Unknown	Yes	null	Unknown
Unknown	Yes	6	6
No	Yes	null	In Progress
Death	Yes	null	Unknown



Data Cleaning & Preparation

Symptoms: Conditional column to find the common symptoms by removing the common testing measures found in the 5 symptom's columns.

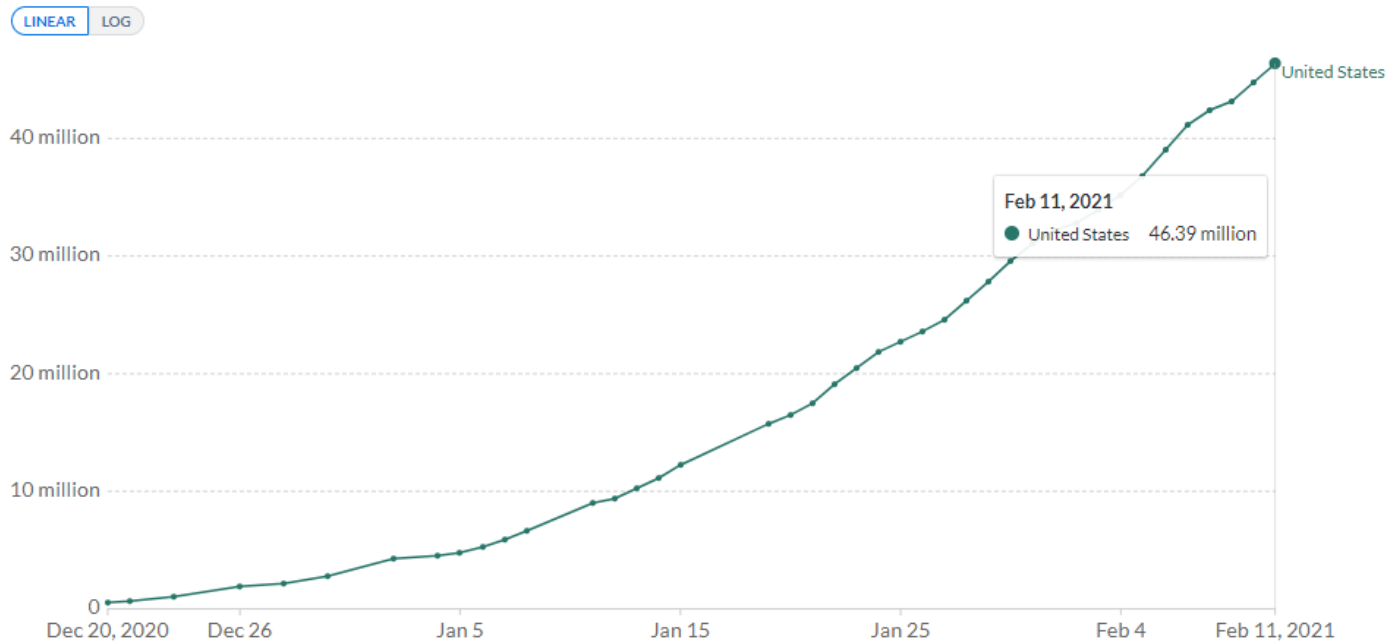
If	Column Name	Operator	Value ①	Output ①
If	SYMPTOM1	equals	ABC 123 Chest X-ray	Then SYMPTOM2
Else If	SYMPTOM1	equals	ABC 123 Electrocardiogram	Then SYMPTOM2
Else If	SYMPTOM1	equals	ABC 123 Computerised tomogram	Then SYMPTOM2
Else If	SYMPTOM1	equals	ABC 123 Angiogram	Then SYMPTOM2
Else If	SYMPTOM1	equals	ABC 123 Magnetic resonance imaging	Then SYMPTOM2
Else If	SYMPTOM1	equals	ABC 123 X-ray	Then SYMPTOM2
Else If	SYMPTOM1	equals	ABC 123 Autopsy	Then SYMPTOM2
Else If	SYMPTOM1	ends with	ABC 123 normal	Then SYMPTOM2
Else If	SYMPTOM1	ends with	ABC 123 test	Then SYMPTOM2
Else If	SYMPTOM1	ends with	ABC 123 tests	Then SYMPTOM2
Else If	SYMPTOM1	ends with	ABC 123 negative	Then SYMPTOM2
Else If	SYMPTOM1	ends with	ABC 123 count	Then SYMPTOM2
Else If	SYMPTOM1	ends with	ABC 123 scan	Then SYMPTOM2
Else If	SYMPTOM1	ends with	ABC 123 therapy	Then SYMPTOM2



US: 46.39 Million Vaccinated as of 11 Feb 2021

Cumulative COVID-19 vaccination doses administered

Our World
in Data



Conclusion

- Overall: **5214 (0.011239%)** reported adverse events of **46.39 Million** total vaccinated single dose
- Gender: More on female
- Age: More on middle age (31 to 50 years old) due to vaccine schedule while death rate higher on older age (81 to 90 years old) due to health complications



Conclusion

- Vaccine Manufacturer: Moderna vaccine have higher % in life threatening & death cases among the adverse events
- Length of stay in hospitals: around 1 or 2 days



Conclusion

Top 10 common symptoms

- Fatigue
- Chills
- Fever
- Arthralgia- inflammation, joints pain
- Abdominal pain
- Dizziness
- Dyspnoea- difficult breathing
- Anaphylactic reaction- life threatening allergic reaction
- Nausea





Thanks!

References:

<https://www.kaggle.com/ayushggarg/covid19-vaccine-adverse-reactions?select=2021VAERSDATA.csv>