***Vaccination Analysis:***

**Q.1 How do vaccination rates correlate with a decrease in disease incidence?**

From the year 2000 forward the coverage rate was basically low and the incidence rate was rising up. But only 2023 incidence coverage rate rose up.

**Q.2 What is the drop-off rate between 1st dose and subsequent doses?**

In the year 2007 the drop off rate was 281.26 and the subsequent doses rate rose up by the year 2000 to 2023, which basically indicates first dose count along with subsequent rose up.

**Q.3 Are vaccination rates different between genders?**

Yes ,vaccination rates are different among among genders and age , pregnant woman and adult at risk are vaccinated more over the years.

**Q.4 How does education level impact vaccination rates?**

Age for the first contact and +M6, +M1 has more schedule rounds as compared to the other age administered.

**Q. 5 Has the rate of booster dose uptake increased over time?**

Booster Dose in 628 in 2018 which rose to 746 in 2023. It has shown an upward trend over the past years.

**Q.6 Is there a seasonal pattern in vaccination uptake?**

In 2000 the vaccination rate count was 1550 and rose up to 5508 in 2023. This has shown an upward trend over the years.

**Q.7 How does population density relate to vaccination coverage?**

There is 0% coverage rate where the population density is less like Russia and South America. But in India it has a coverage rate of 78% and China has the highest coverage rate of 94%.

**Q.8 Which regions have high disease incidence despite high vaccination rates?**

China has high incidence rate and as well vaccination rates.

**Q.9 Is there a correlation between vaccine introduction and a decrease in disease cases?**

As the count disease cases increasing over the years but the vaccination introduction stagnant over the years.

**Q.10 Which diseases have shown the most significant reduction in cases due to vaccination?**

CRS , Diptheria . Japenc, Measels and many more has shown reduction in disease cases due to vaccination coverage over the years.

**Q.11 What percentage of the target population has been covered by each vaccine?**

DTPCV3 has a coverage count of 5588 , MCV1 has 5519 and POL3 has 5242. The most lowest coverage and targeted population was for vaccine PCV1.

**Q12. How does the vaccination schedule (e.g., booster doses) impact target population coverage?**

The booster dose for Diptheria antigen was 729 for coverage count as compared to antigens it was highest. The lowest one was for Tetnus.

**Q.13 Are there significant disparities in vaccine introduction timelines across WHO regions?**

Yes, there is a significant disperities over the WHO region for vaccine introduction. EUROPE along with AFRO has the highest vaccine introduction rate. But EMRO has 15% vaccine intro and WPRO around 20% which basically low.

**Q.14 How does vaccine coverage correlate with disease reduction for specific antigens?**

Well the most vaccination coverage is for CRS, Diptheria , Measeles, etc. as compared to POLIO which is lesser.

**Q.15 Are there specific regions or countries with low coverage despite high availability of vaccines?**

In EUROPE , with countries like Italy , Hungery, Cotia etc. have low coverage rate even though vaccine introduction is more in EUROPE.

**Q. 16 Are certain diseases more prevalent in specific geographic areas?**

Yes, Diptheria and Measles are more prevalent in North America. Diptheria crossing more than 688 and Measles with highest over 884.

**Q.17  A government health agency wants to identify regions with low vaccination coverage to allocate resources effectively.**

The most regions with coverage rate are in Russia , Africa and South America.

**Q.18 A public health organization wants to evaluate the effectiveness of a measles vaccination campaign launched five years ago.**

Over the past years the performance of Mealses has been imp=roved from 2000 to 2023. In 2000 it had a count of 89 but in 2023 it reached to 211.

**Q.19 A vaccine manufacturer wants to estimate vaccine demand for a specific disease in the upcoming year.**

The vaccination demand for DTPCV3 ,MCV1 ,POL3 is more in the past trends . So by looking the past patterns these antigens could be demanded more over future trends.

**Q.20  Researchers want to explore the incidence rates of polio in populations with no vaccination coverage.**

When the Coverage rate is high the incidence rate in POLIO is low and vice versa. As for Count coverage for POLIO for 623620 it has a 0% incidence rate as compared to a coverage of 270 it has incidence rate of 620%.

**Q21. WHO wants to track global progress toward achieving a target of 95% vaccination coverage for measles by 2030.**

By looking at the trend I can see the count of coverage for Measles has been increased from 35 in 2000 year to 211 in 2023. I can see it has slow rise for the coverage . So as for 2030 year it might be able to hit 95% target if number of vaccine introduction and schedules will be doubled the performance.

**Q.22 Authorities want to determine how vaccination rates vary throughout the year.**

Over the year the coverage rate has increased from 1550 in 2000 to 5508 in 2023.