

COVID-19 vaccines

**Role of COVID-19 vaccines in reducing
hospitalization among governmental health
care workers in Gaza Strip: A population-
based cross-sectional study**

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Health care workers (HCWs) are at high risk of catching infection hence they are at the frontline of the COVID-19 pandemic

Several vaccine types were used in Gaza Strip

1. RNA vaccines

- BNT162b2 messenger RNA (mRNA) vaccine (Pfizer–BioNTech)
- mRNA-1273 vaccine (Moderna)

2. Adenovirus vector vaccines

- ChAdOx1 nCoV-19/AZD1222 (Oxford, AstraZeneca)
- Gamaleya GamCovidVac (Sputnik V and Sputnik light)

3. Live attenuated **CoronaVac** (Sinopharm)



Aim of the study

To prescribe the effectiveness of different COVID-19 vaccine types in the prevention of hospitalization among HCWs in the Gaza Strip



Objectives of the study

1

To compare the effectiveness of different COVID 19 vaccines in the Gaza strip (HCWs)

2

To find to how much different COVID 19 vaccine can prevent hospitalization in our settings among HCWs

Methodology



Study Population, Data Sources, and Study Design

The study population was all alive governmental health care workers in Gaza Strip at **25/8/2020**

The study population was divided into 3 categories:



Not Vaccinated



**Received one dose
of vaccine.**

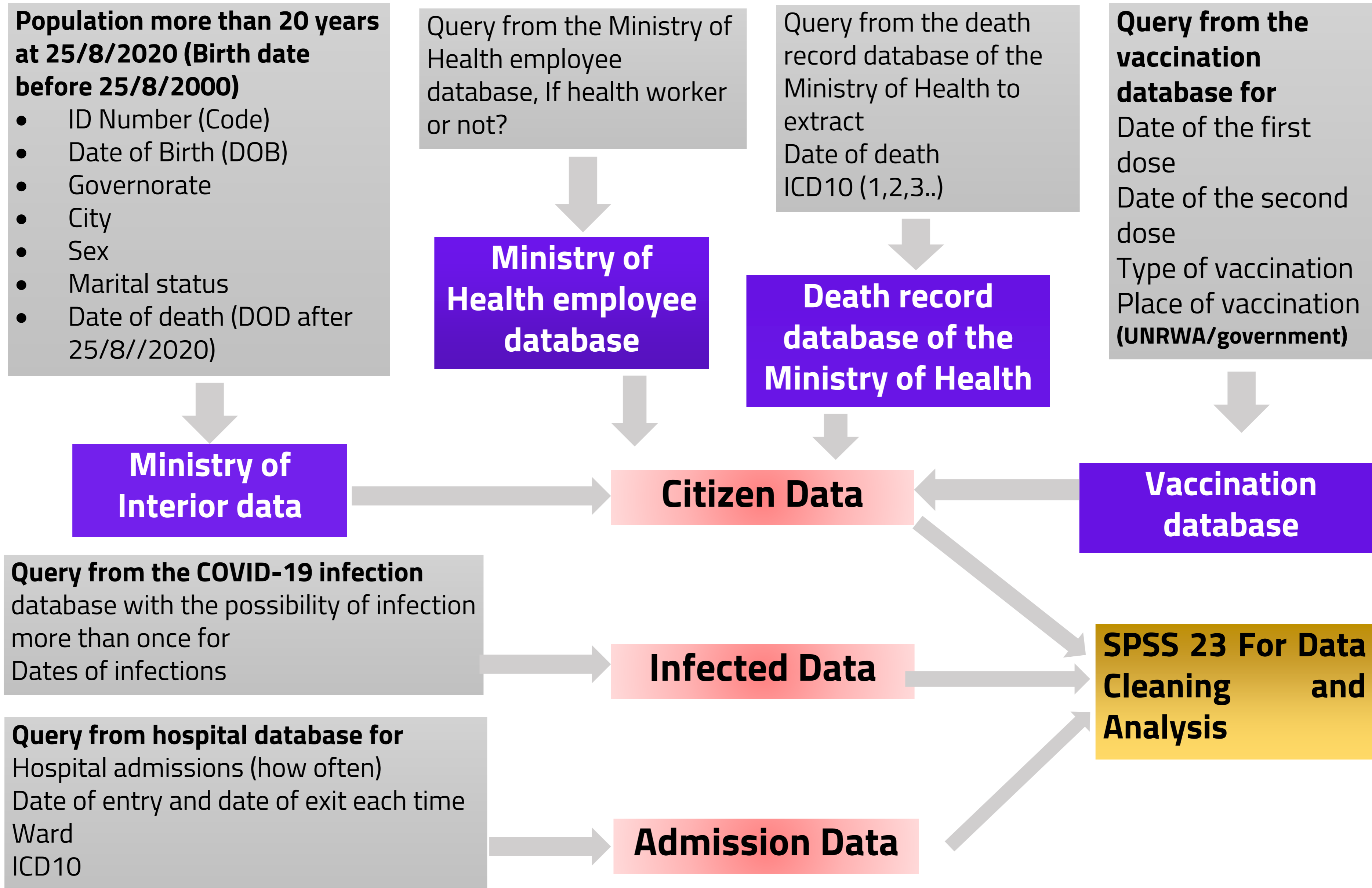


**Received two doses of
vaccine OR one Dose
Sputnik-light.**

Study Design and Timeline

- **A cross-sectional, retrospective and population-based study.**
- **Data cutoff point time was 30/9/2021**

Data Sources



Inclusion criteria

Eligibility criteria included

All Gaza strip governmental health care workers aged 20 years or old at the time of COVID-19 announcement (25/8/2020) (**Born before 25/8/2000**)

Receipt of at least one dose of

- BNT162b2 mRNA vaccine (Pfizer)
- mRNA-1273 vaccine (Moderna)
- GamCovidVac (Sputnik V)
- Sputnik light
- ChAdOx1 nCoV-19/AZD1222 (Oxford, AstraZeneca)
- Inactivated SARS-CoV-2 vaccine (CoronaVac) (Sinopharm)

No receipt of any Covid-19 vaccination

Exclusion criteria

- In this study governmental health care workers younger than 20 years at date 25/8/2020 were not included
- Persons who died or were hospitalized in the period before 25/8/2020

Partially immunized (≥ 14 days after receipt of the first vaccine dose and before receipt of the second dose) **Pfizer, Moderna, Sputnik V, AstraZeneca, or Sinopharm** vaccines

Fully immunized (≥ 14 days after receipt of the second dose) **Pfizer, Moderna, Sputnik V, AstraZeneca, Sinopharm, or one dose of Sputnik light** vaccines.

Outcomes measures

Outcomes of interest were

- Hospital admission for Covid-19
- Case of hospital admission

Statistical Analysis

- **Statistical Analysis was done by using SPSS version 23**
- **Crosstabulation and frequencies were done**
- **Chi square (X2) and Odds Ratio (OR) were used to define statistical significance of differences at p value < 0.05 at 95% CI**
- **Vaccine effectiveness = 1 – odds ratio of vaccination among case participants as compared with controls or by the equation**

$$\%RRR = \frac{(\text{Rate of event in nonVaccinated} - \text{Rate of event in Vaccinated})}{\text{Rate of event in nonVaccinated}} \times 100$$

- **RRR (relative risk reduction)**
- **Survival curves for the vaccinated and unvaccinated groups were estimated with the Kaplan–Meier estimator**



Results

1,141,772 of total population aged 20 years and more at **25/8/2020** were included
12,952 HCW (1.1%)

2,434 HCW (18.8%) were not vaccinated
755,853 (66.2%) Were not vaccinated

10,518 HCW (81.2%) were vaccinated
385,919 population (33.8%) Were vaccinated

3,532 (27.3%) Received one dose of vaccine

7,012 (66.5%) Received two doses of vaccine OR one Doss Sputnik-light

Moderna 512 (5.0%)
One Dose= 142 (27.1%)
Two Doses= 380 (72.9%)

Spotnic-light 1,843 (14.2%)

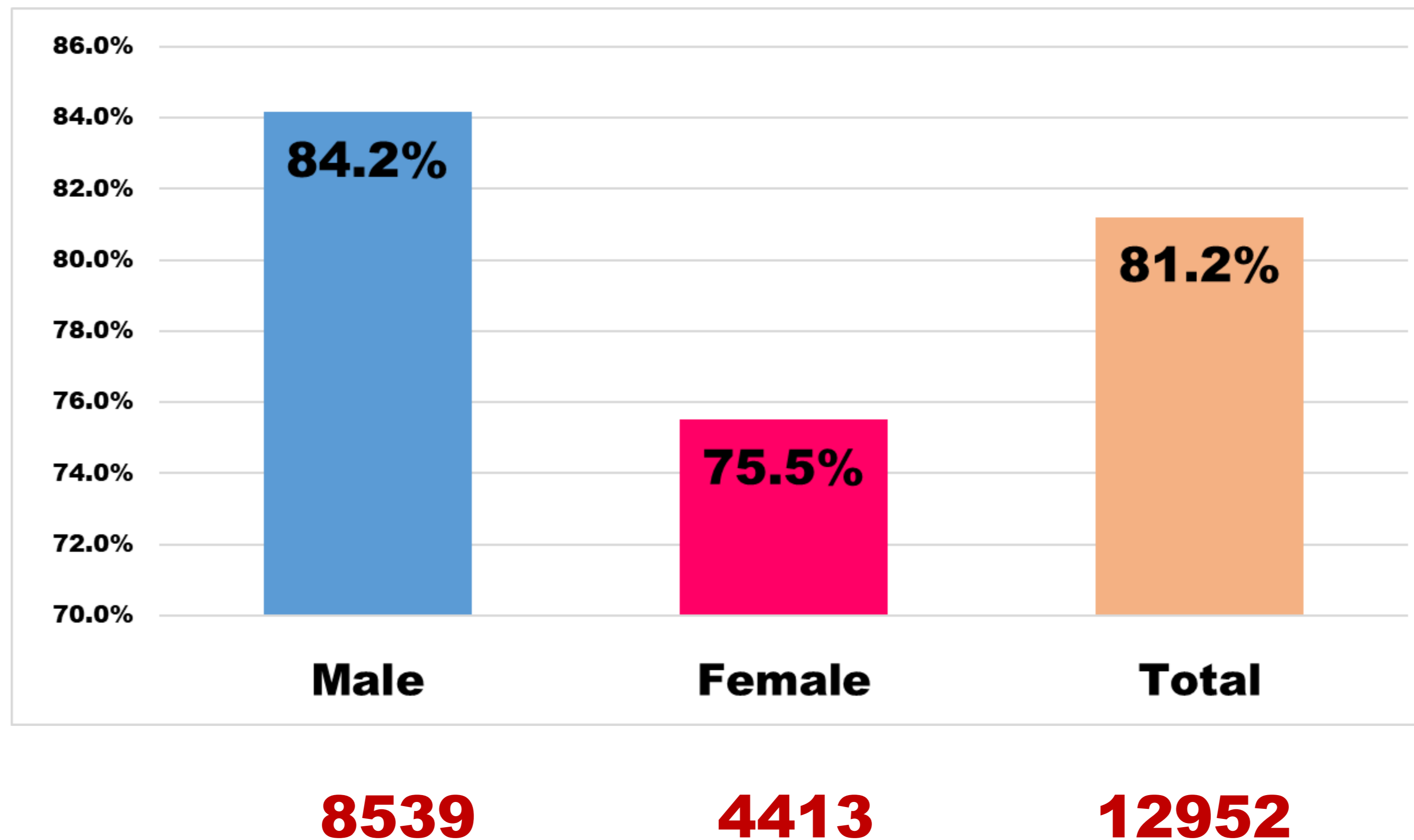
Pfizer 5,795 (55.1%)
One Dose= 2,875 (49.6%)
Two Doses= 2,920 (50.4%)

Oxford-Astrazenica 36 (0.3%)
One Dose= 18 (50.0%)
Two Doses= 18 (50.0%)

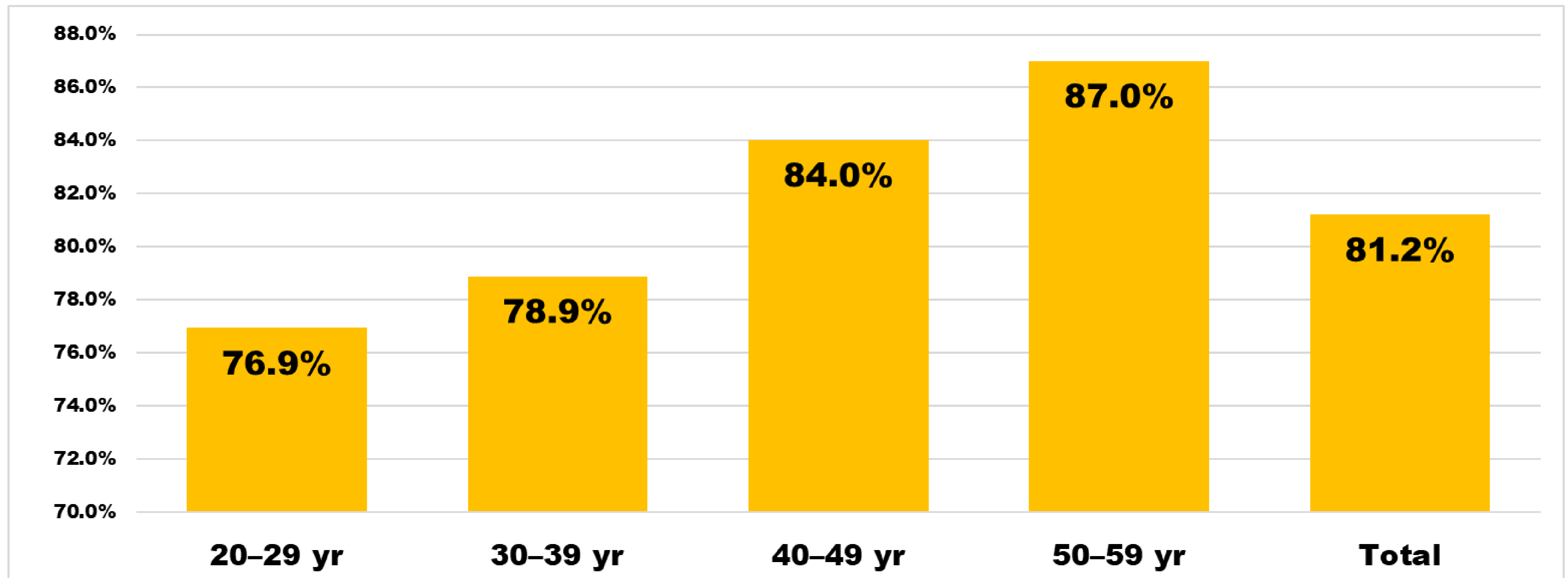
Sinopharm 157 (1.5%)
One Dose= 64 (40.8%)
Two Doses= 93 (59.2%)

Spotnic-V 2,166 (16.7%)
One Dose= 195 (9.0%)
Two Doses= 1,971 (91.0%)

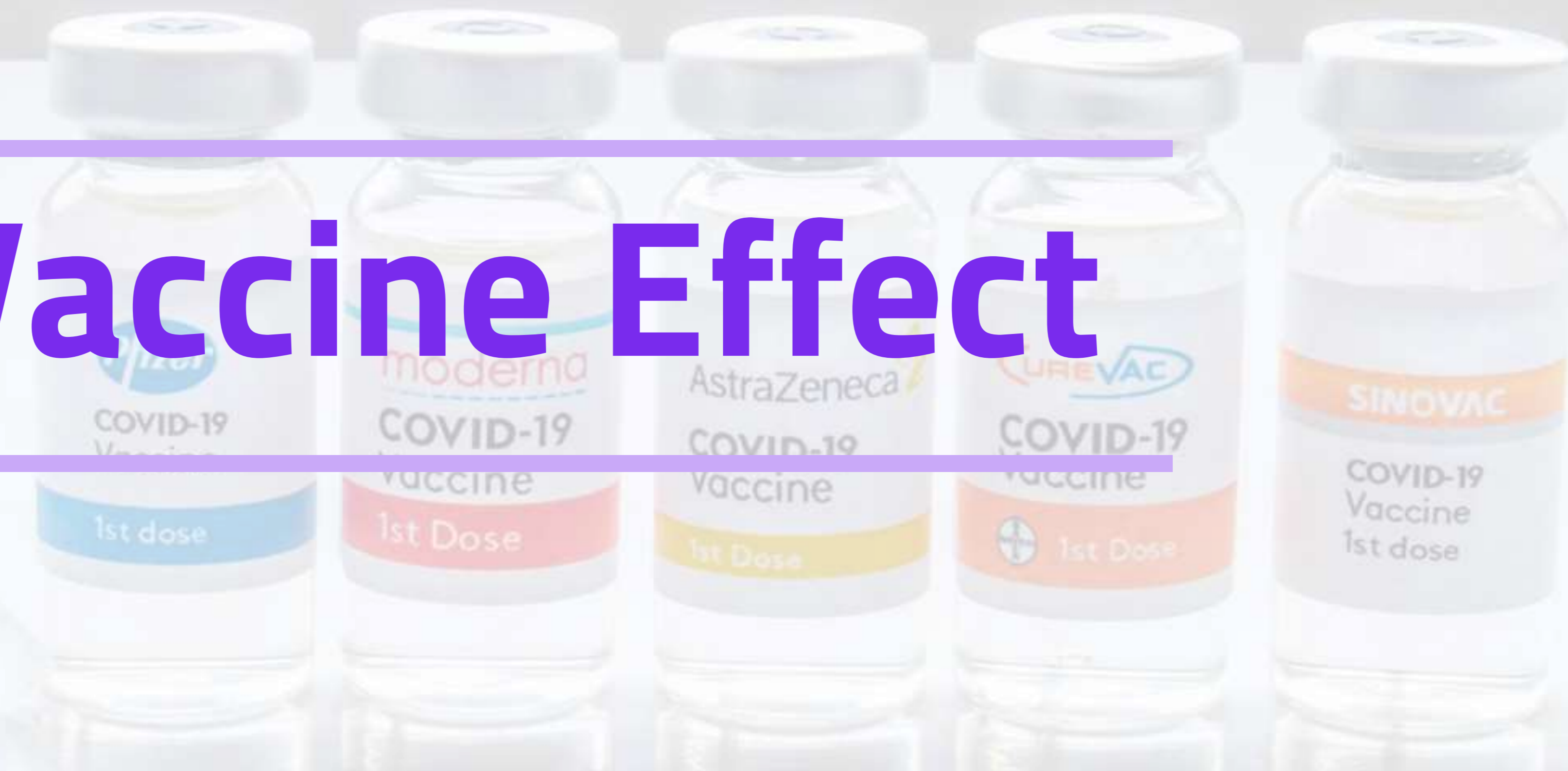
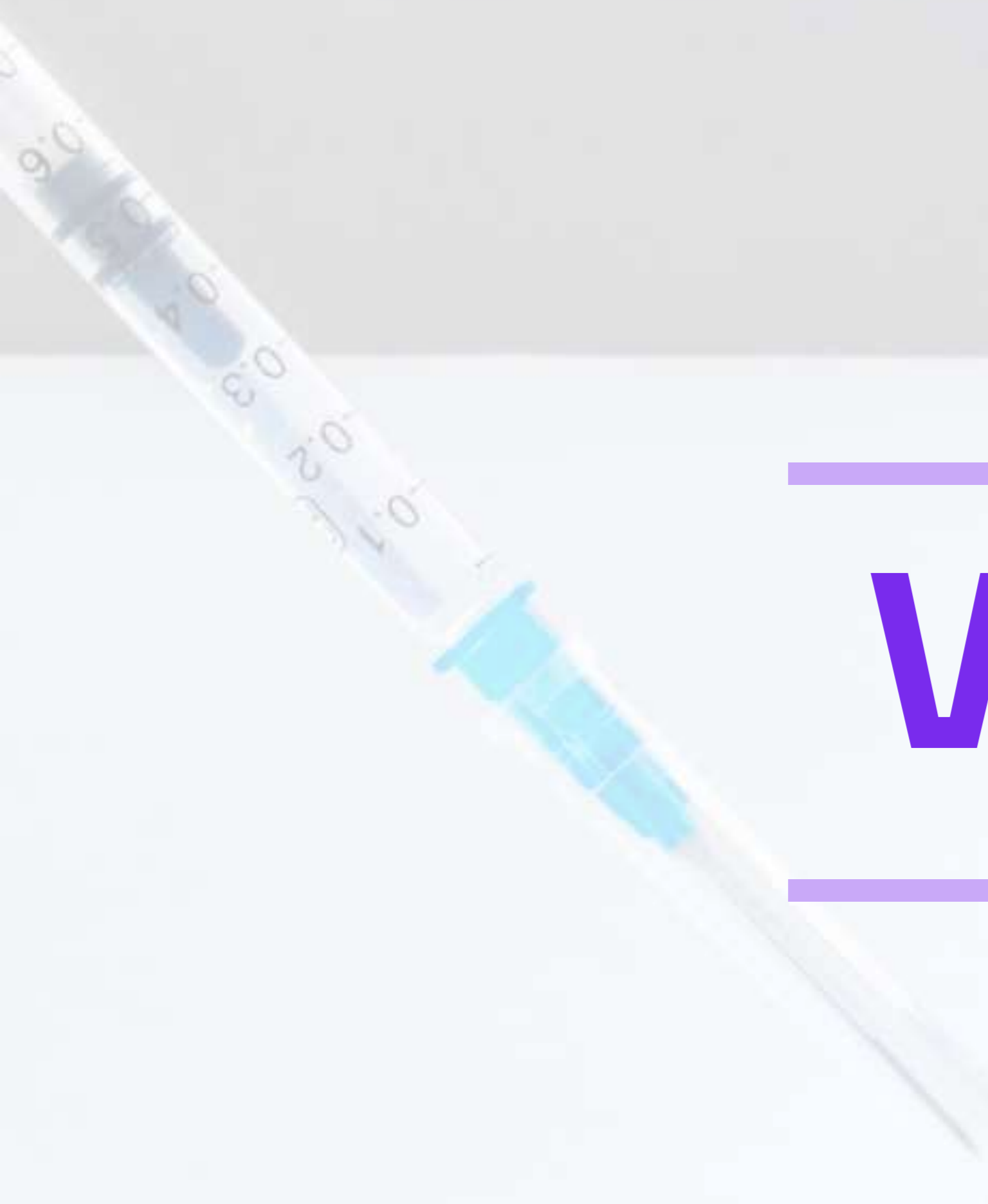
Gender Vaccination Status (30/9/2021)



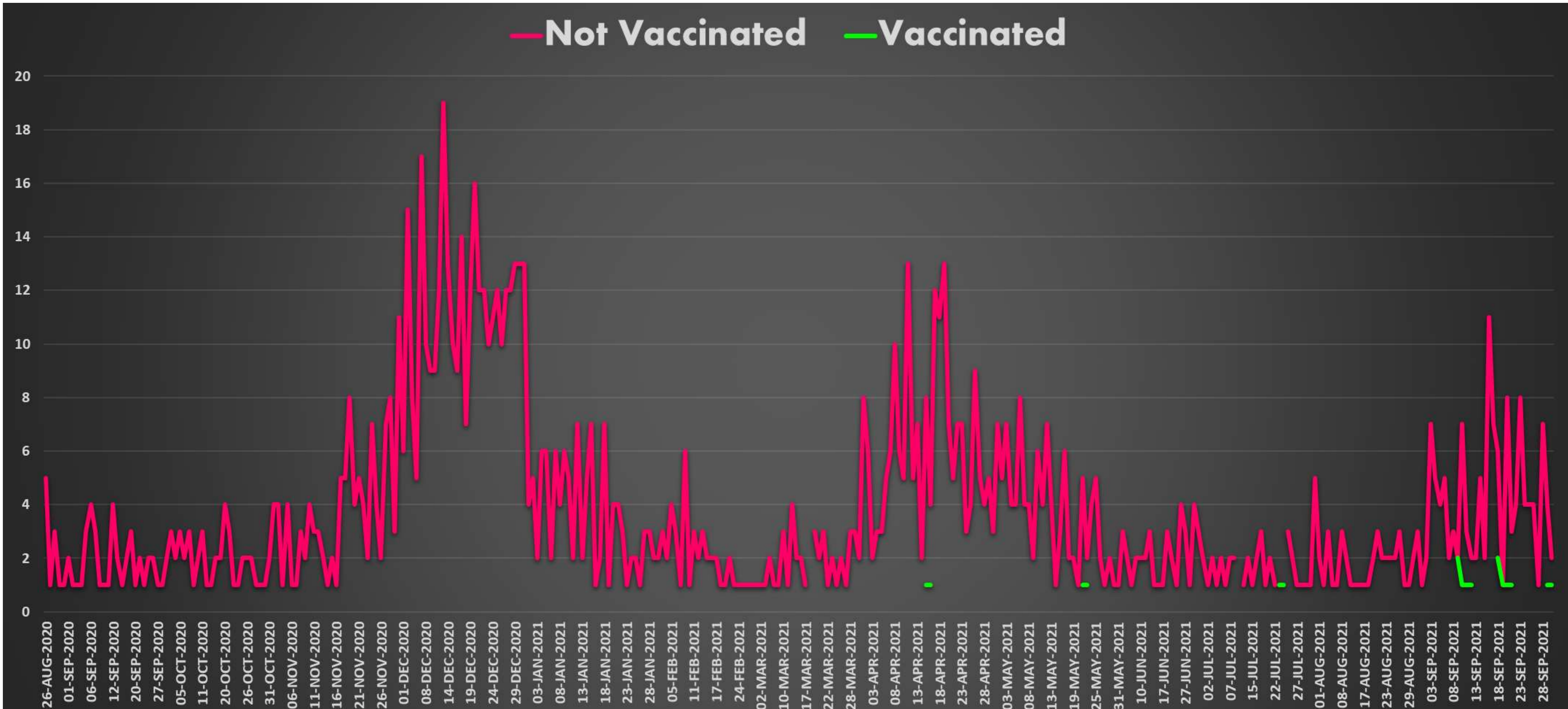
Age Category Vaccination Status



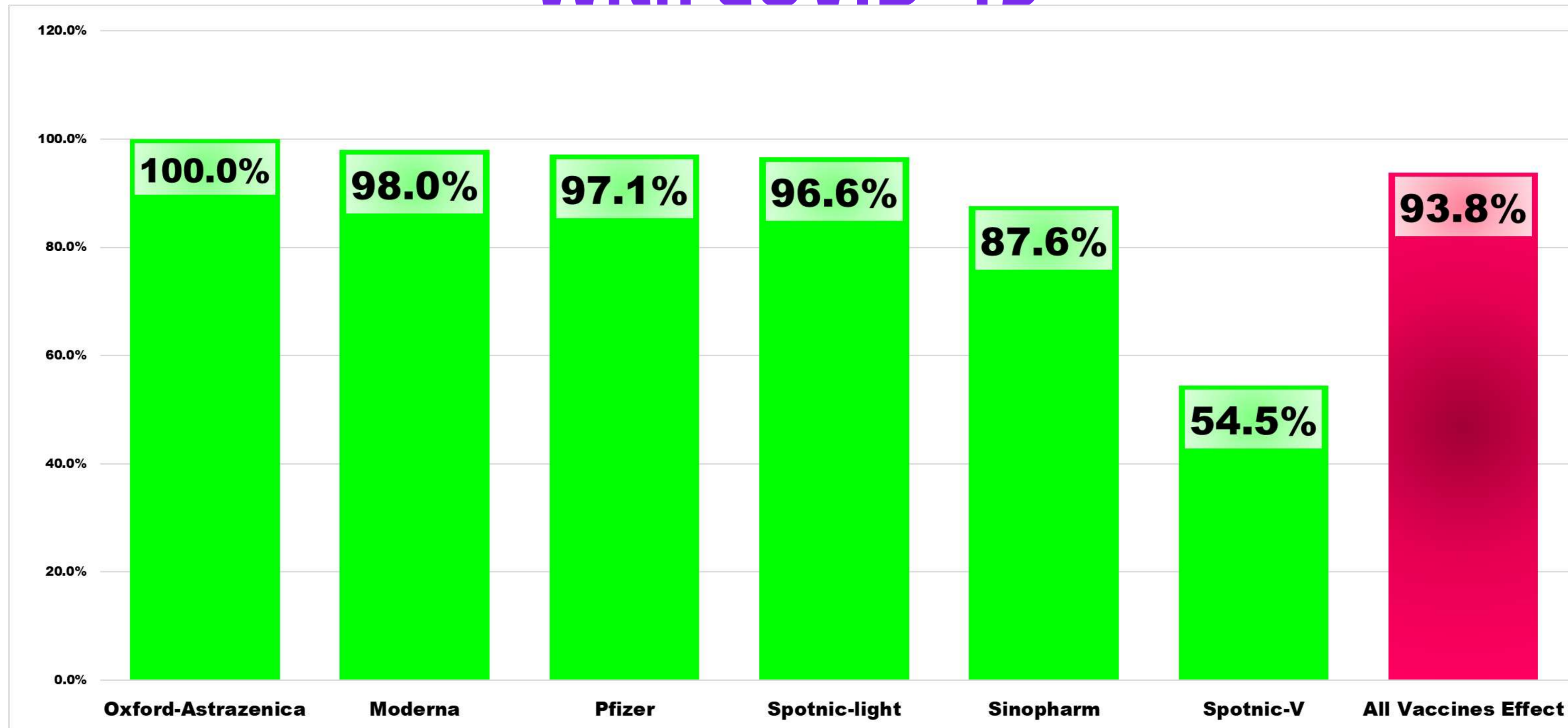
Vaccine Effect



COVID-19 Pandemic Death Waves



Differences Between Different Vaccine types in Protective effect from Death With COVID-19



6157

89126

145477

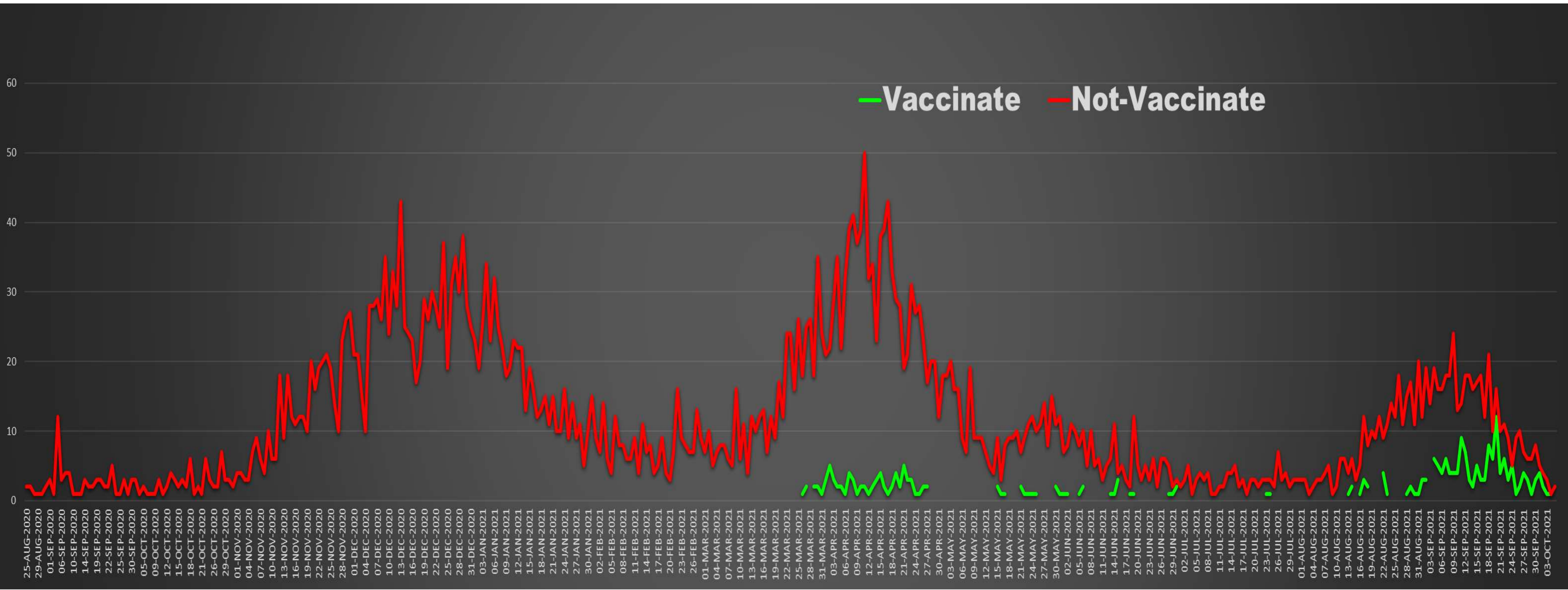
106490

9690

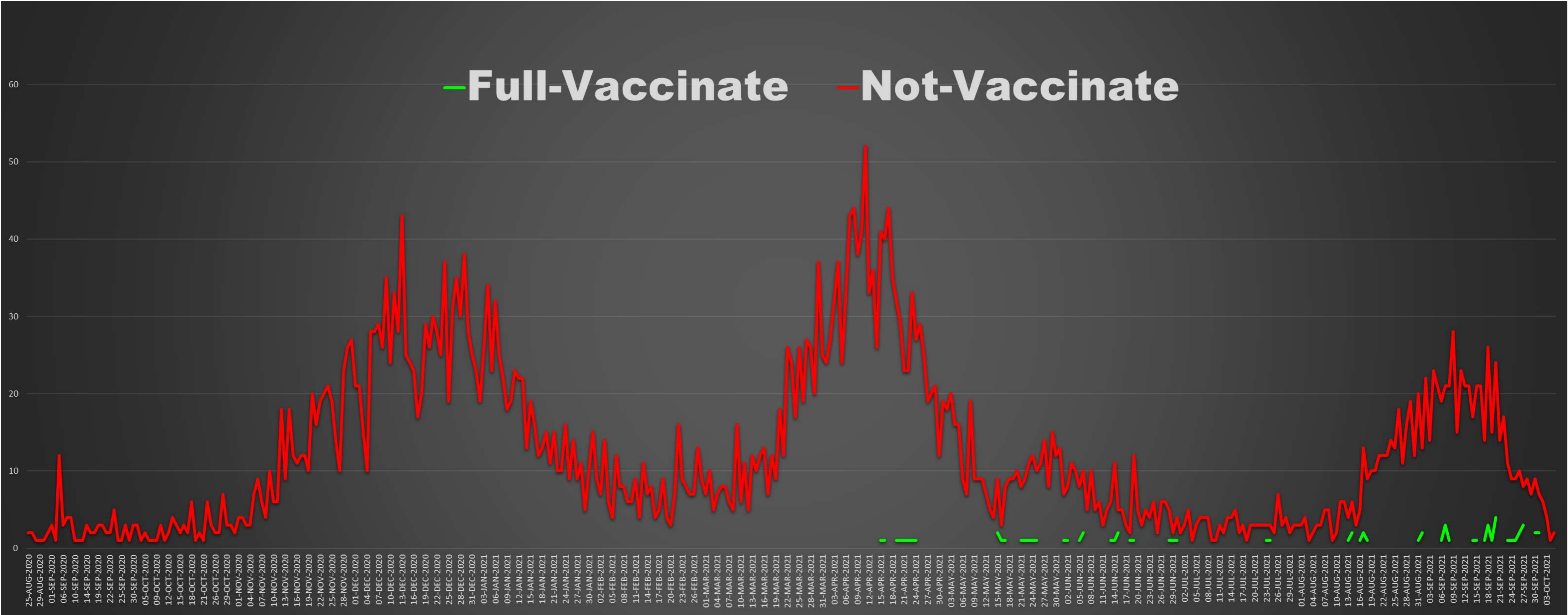
28979

385919

COVID-19 Pandemic Hospital Admission Waves (Vaccine 1st Dose)

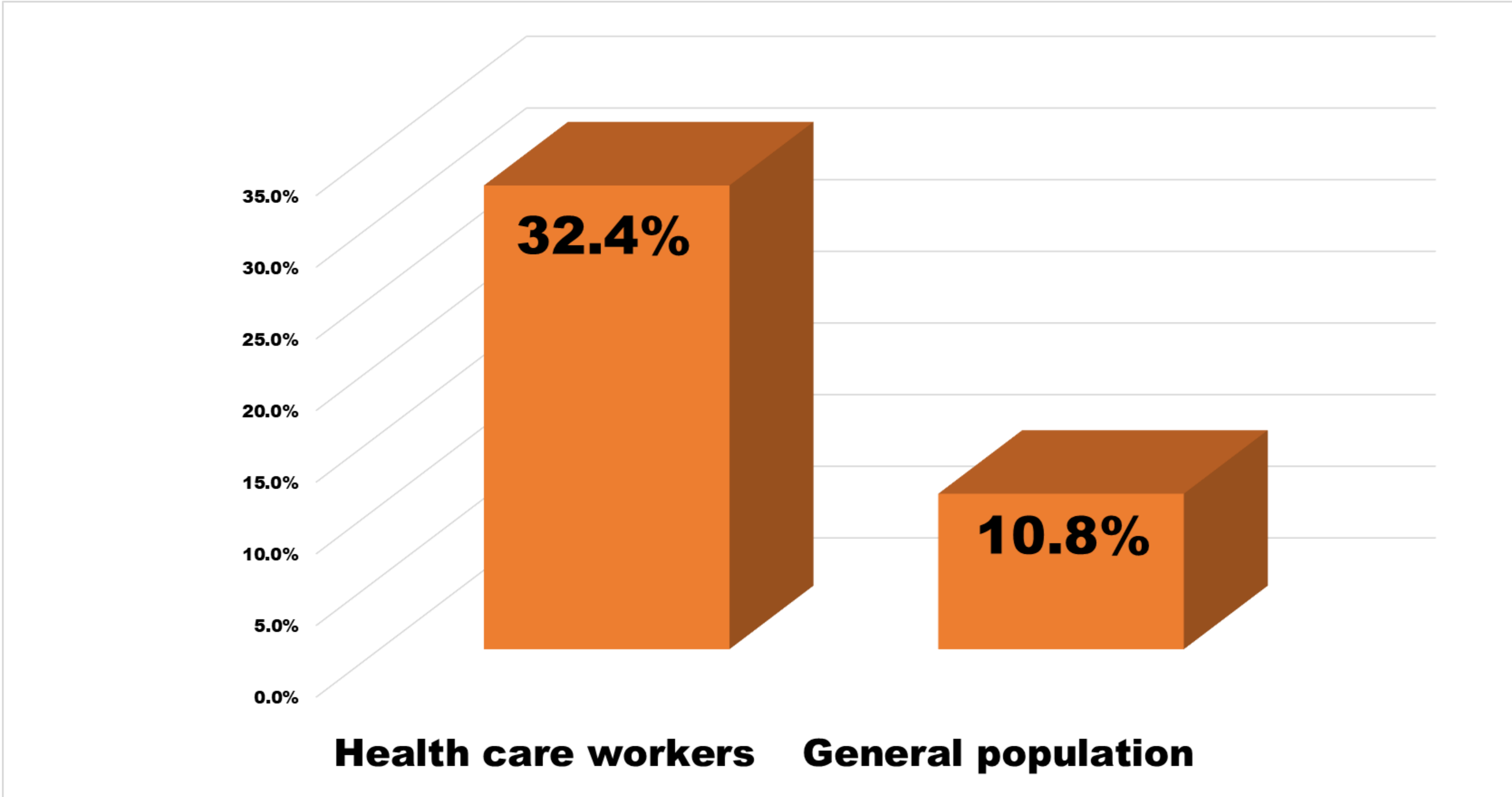


COVID-19 Pandemic Hospital Admission Waves (Vaccine 2nd Dose)

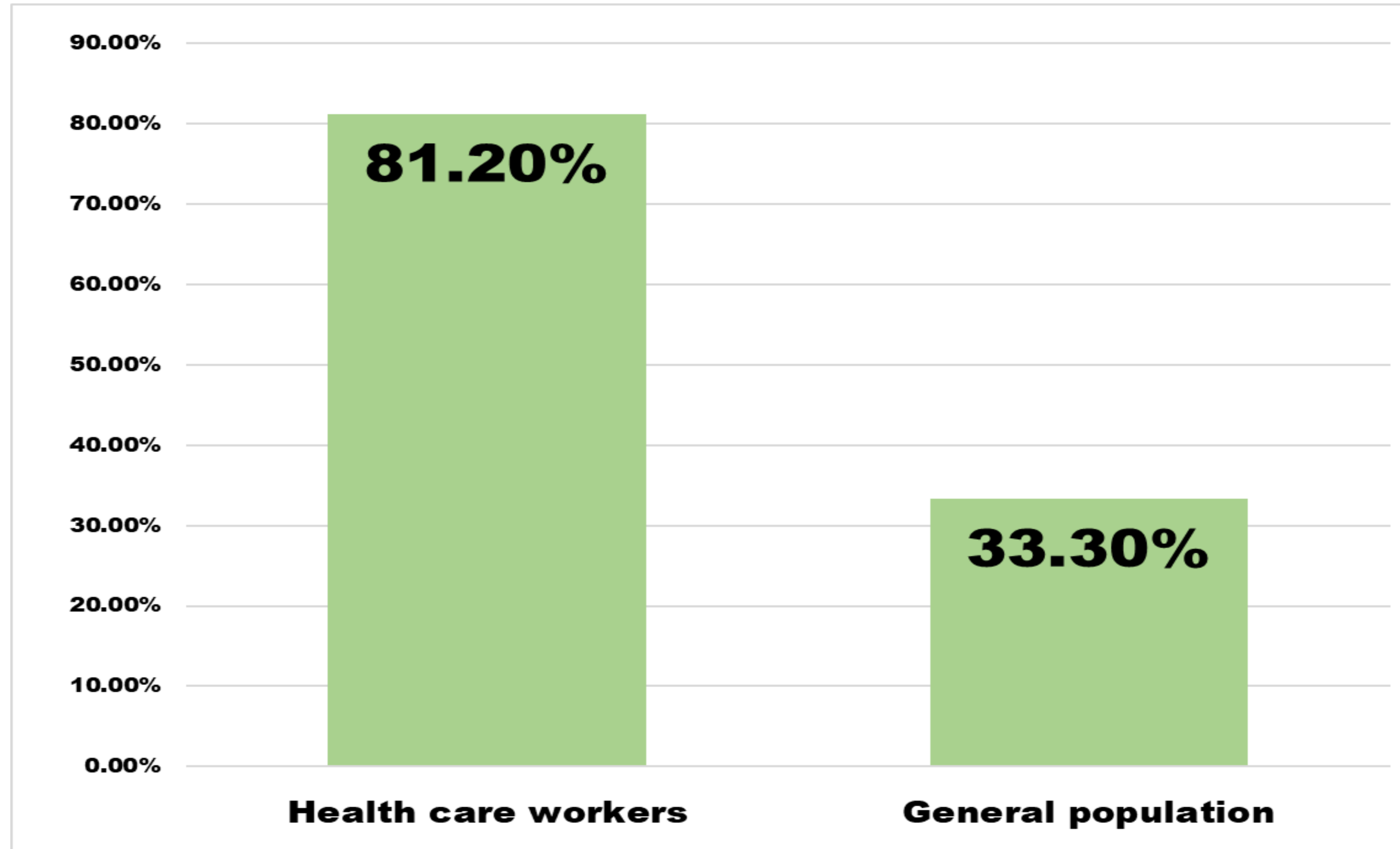


Vaccination Protective Effect Among Health Workers

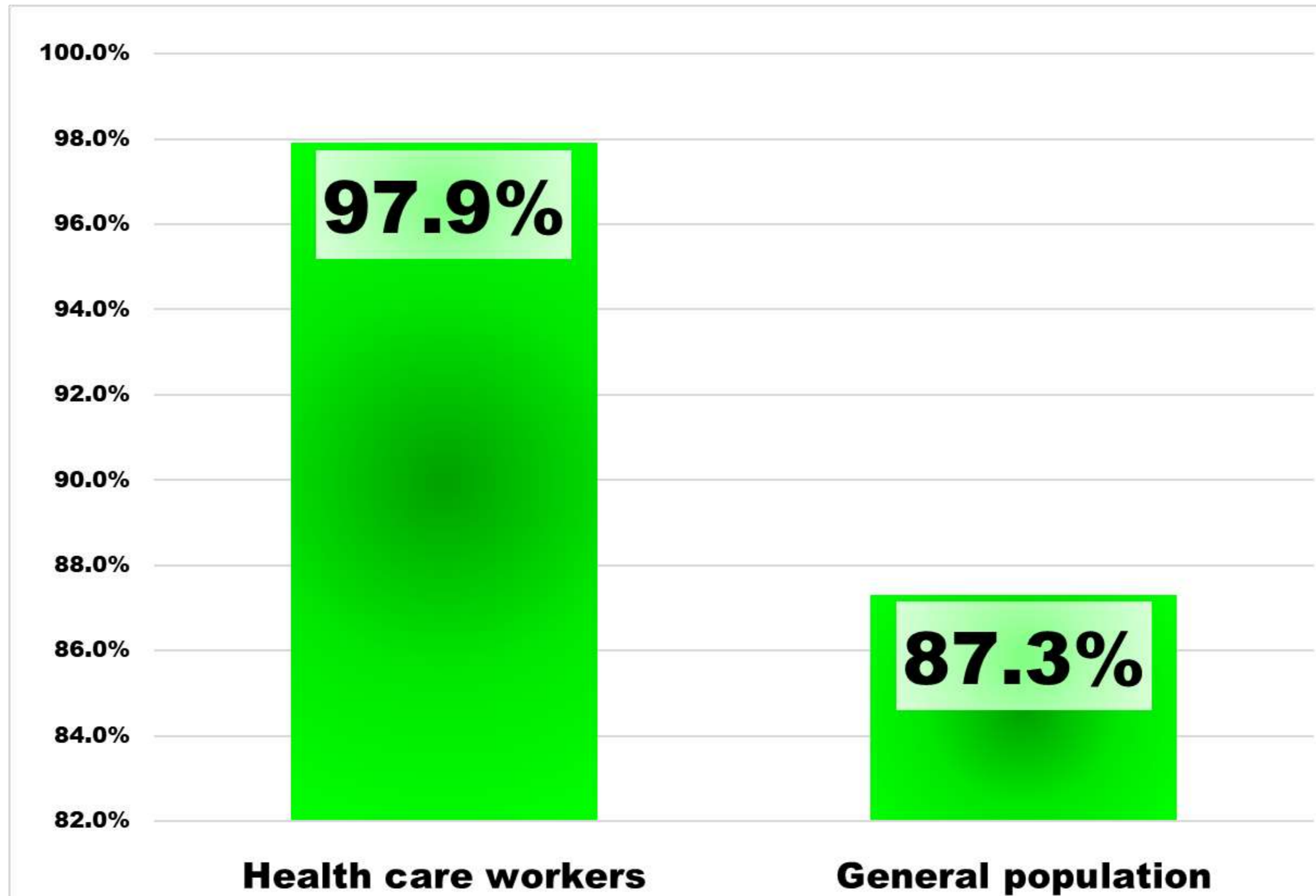
Risk of Infection



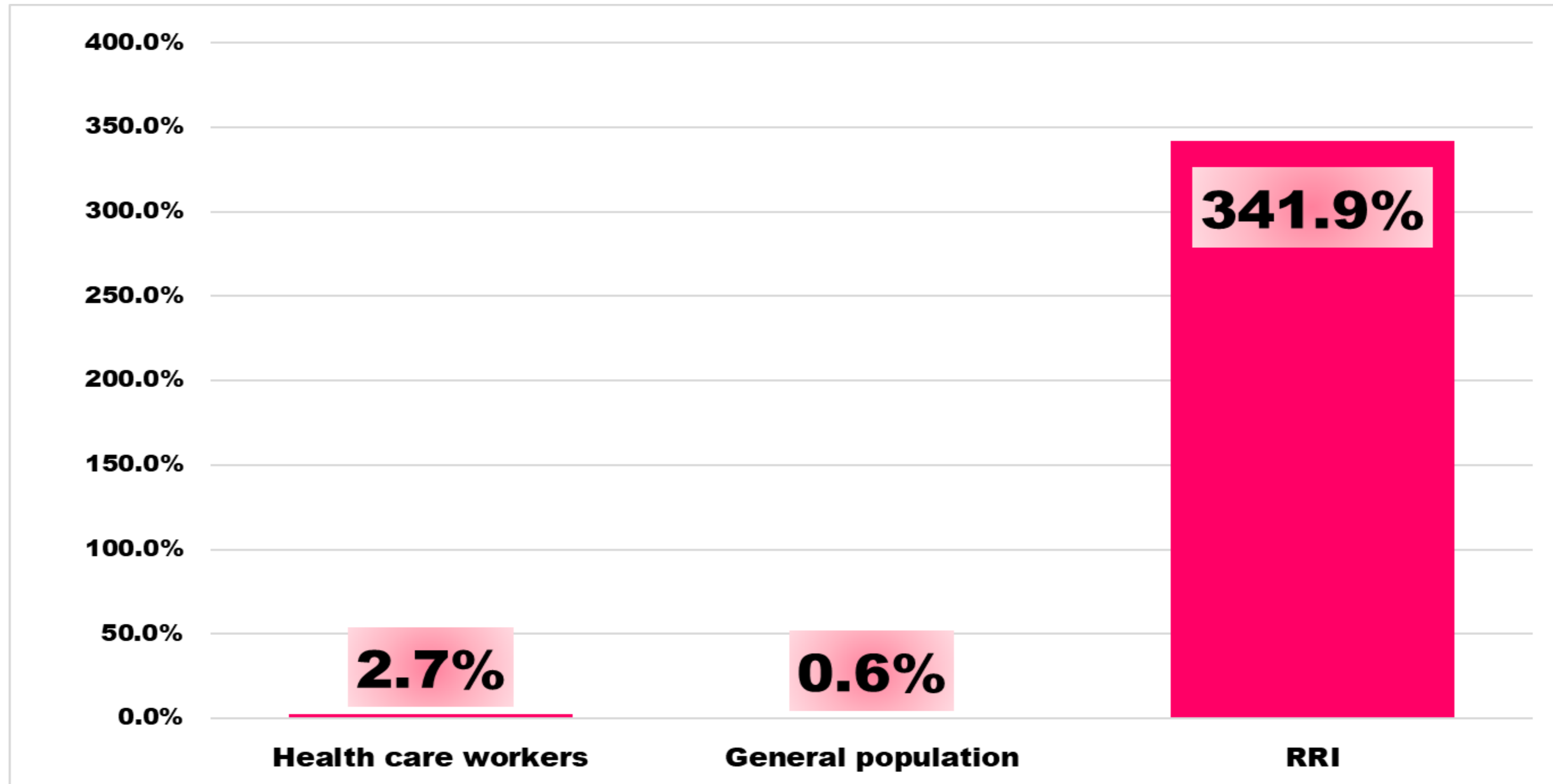
Comparison of Vaccination Status Between Health Workers and Population



Vaccine Protective effect Among Health workers



Increased Risk of Hospitalization Among Non-Vaccinated Health Workers

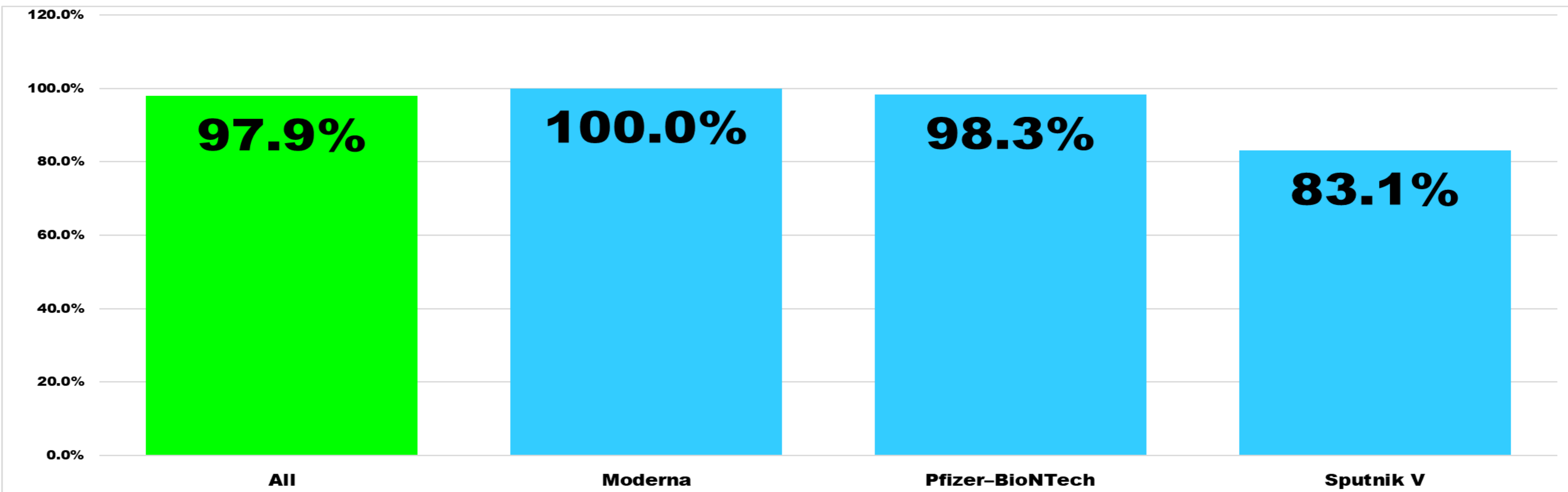


Hospital Admission



Vaccination Protective Effect From COVID-19 Hospitalization among HCWs

First Dose Protection



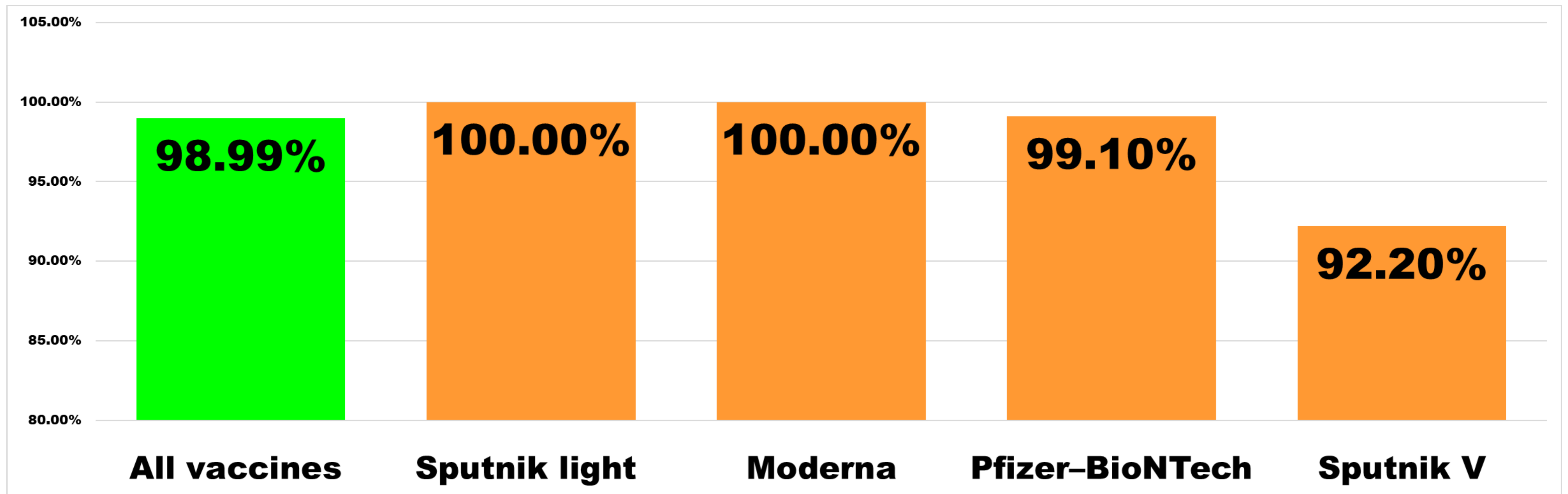
HR= 0.020 (0.009- 0.047)

HR=0.017 (0.004-0.071)

HR= 0.168 (0.058-0.482)

Vaccination Protective Effect From COVID-19 Hospitalization among HCWs

Second Dose Protection



HR= 0 .010 (0.003- 0.031)

HR=0.008 (0.001- 0.061)

HR= 0.078 (0.018-0.327)

Results Interpretation

- **Overall, our study results suggest that the COVID-19 vaccines were with high effectiveness in protecting against hospitalization**
- **These findings were in consistence with the results done in other countries for every vaccine with some differences**

Results Interpretation

- **Effectiveness of Spotnic-V vaccine was seen to wane especially after 120 days and this reflects overall its results hence**
 - **It was the first vaccine used in Gaza strip**
 - **The long period in which it was studied “more than 210 days”**

Special Recommendations

- **Intensifying vaccination campaigns to include women and areas with low rate vaccination**

Special Recommendations

- **Mandatory vaccination of health sector workers**
- **Completion of the study to find out the effect of the third dose on protection from hospitalization and death.**
- **Expansion of the patient and vaccinated registration database to include pregnant women and chronic diseases.**

Common Recommendations

- **Develop a system to track side effects of all vaccinations**
- **Develop registration system to track chronic diseases and others by ID number**

Limitations

- **Missing data for smoking status or body-mass index (BMI) and nutrition habits**
- **Co-Morbidity were not included in this study**
- **Third doze Vaccine was not included**



THANK YOU