



## Measles Vaccine Coverage in Ghor, Afghanistan: A Descriptive Study, 2020-2022

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**Background:** Measles remains a leading cause of childhood morbidity and mortality worldwide, despite increased vaccination efforts. This study aims to examine measles vaccine coverage in Ghor province from various aspects (person, place, and time).

**Methods:** This descriptive study analyzed measles vaccination coverage in Ghor from 2020 to 2022, using data from the DHIS-2 system. Coverage rates, as well as variations across districts and health centers, were calculated using Excel and Epi Info 7.

**Results:** A total of 33,173 individuals were vaccinated, with a coverage rate of 75%. The dropout rate was high at 18%, and seasonal variations significantly impacted coverage, with the lowest rate in winter (65%) due to road closures and limited access to health services. Coverage improved to 85% in spring. The vaccination rate rose from 73% in 2020 to 78% in 2022. Districts like Ferozkoh, Dollatyar, and Sagher achieved coverage above 80%, while others reported lower rates. Health centers in underserved areas without outreach vaccinators had lower coverage.

**Conclusion:** Although measles vaccination coverage has improved in Ghor, it remains below the target. To further enhance coverage, strengthening mobile vaccination services, expanding health infrastructure, and increasing public awareness are essential strategies.

**Keywords:** Afghanistan, Coverage, Ghor, Measles, Vaccine

### Introduction

Vaccine is a biological precreation that improve immunity to a particular disease [1]. Measles is a highly infectious disease that results from infection with the measles virus [2]. Measles is one of the top causes of childhood morbidity and mortality and responsible for over 2 million childhood deaths each year before the introduction of measles vaccines and the increase in global measles vaccine coverage in the 1980s [3]. Measles vaccination strategies have evolved over time. The World Health Organization (WHO) currently recommends that the first dose of measles-containing vaccine (MCV1) should be administered at 9 months of age in settings with endemic measles [4]. High levels of population immunity necessary to interrupt measles transmission, however, cannot be achieved with a single dose schedule, and a second dose (MCV2) is therefore usually given at 15–18 months of age with a minimum of 4 weeks between the two doses [5]. Measles vaccines are commonly provided in 10-dose vials but health care workers may be reluctant to open a multi dose vial if few children are to be vaccinated on a given day to prevent wastage [6]. Before the measles vaccination program

started in 1963, an estimated 3 to 4 million people got measles each year in the United States [7]. Global MCV1 coverage reached 85% in 2009, but has remained around this proportion [8]. In 2016 the African Region (AFR, 72%) and Eastern Mediterranean Region (EMR, 77%) regions had the lowest coverage, followed by the South-East Asia Region (SEAR, 87%), Americas Region (AMR, 92%), European Region (EUR, 93%) and Western Pacific Region (WPR, > 95%) [9]. In the EUR MCV1 coverage was greater in 2012 (95%) than 2016 and district-level declines have occurred in highly immunized (> 90% MCV1) countries [10]. In Afghanistan, the low coverage of measles vaccine caused outbreaks and deaths of many children. The National MCV1 coverage was 33% in 2000, 44% in 2006, and 41% in 2007 the country saw its measles vaccination coverage slightly increasing from 53% in 2008 to 56% in 2010 [11]. Ghor province, located in central Afghanistan, is characterized by its rugged, mountainous terrain. It is bordered by several provinces, including Herat, Badghis, Faryab, Bamyan and Helmand. The province has a largely rural population, with limited infrastructure and healthcare access, which poses challenges for delivering essential health services, including vaccination programs [12]. This study aims to examine measles vaccine coverage in Ghor province from various aspects (person, place, and time).

## Materials and Methods

In this study, a descriptive approach was used to review measles vaccine coverage data from 2020 to 2022. The research team extracted and compiled national measles vaccination data reported for Ghor, Afghanistan, during the same period. The data was retrieved from the DHIS-2 database of the Ministry of Public Health. Rates, ratios, and proportions were calculated using Excel and Epi Info 7.

## Results

In total, the number of individuals who received the measles vaccination is 33,173. Among them 16,961(51.1%) individuals were male and 16,212(48.9%) individuals were female. The vaccine coverage rate in Ghor province was low (75%) compared to the set target. Drop out was high (18%) and coverage was low compared to other. Some health centers that do not have outreach vaccinators and are located in areas not covered by vaccination services had lower measles vaccine coverage. Vaccination coverage was low 65% in winter compared to other seasons. Due to road closures and people's lack of access to health centers and during spring was 85%. Measles vaccination coverage (78%) increased in 2022 – and 2020 was 75% and 2021 was 73% because security was ensured, people could easily take their children to be vaccinated, and the number of health centers in white areas was also established and some health centers were upgraded from Sub-Health Center (SHC). Three district measles vaccine coverage Ferozkoh, Dollatyar, Sagher was over 80% other district was lower 80%.

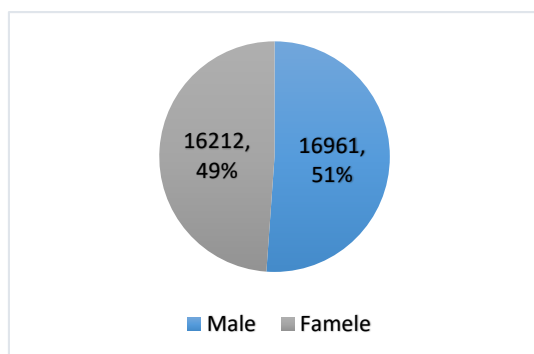


Figure 1: Measles vaccine coverage by gender Ghor, Afghanistan 2020-2022.

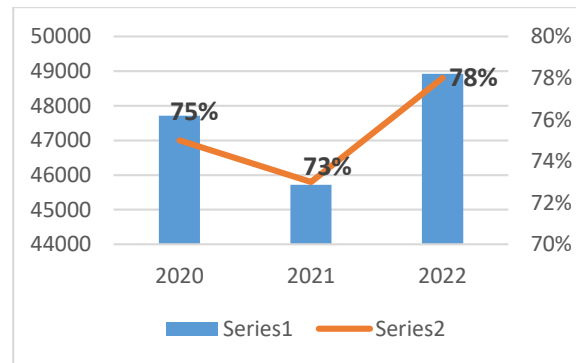


Figure 2: Measles vaccine coverage by year (Series 1) from 2020-2022 and percentage (Series2) in Ghor, Afghanistan.

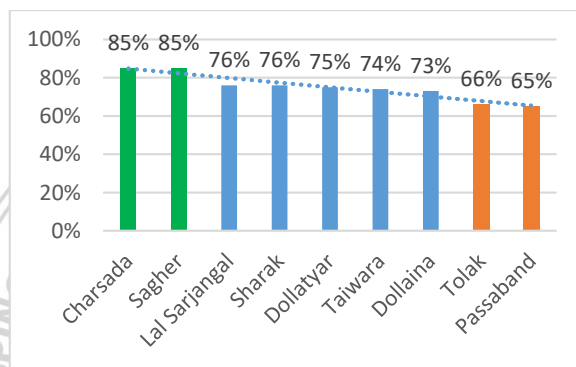


Figure 3: Measles coverage district wise Ghor, Afghanistan 2020-2022.

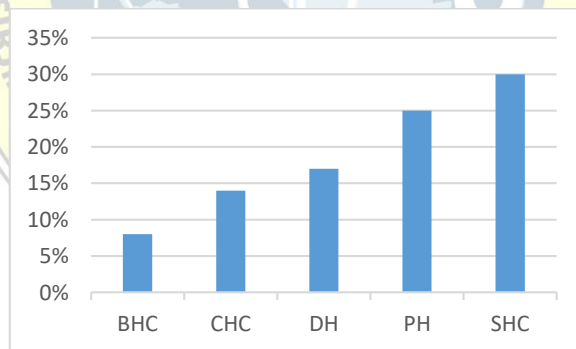


Figure 4: Measles vaccine drop out by health facility Ghor, Afghanistan 2020-2022.

## Discussion

The study found that measles vaccination coverage in Ghor province was 75%, below the target rate. This is consistent with findings in other parts of Afghanistan, where vaccination coverage is often too low due to challenges such as geographic isolation, limited health infrastructure, and security issues. A study in Kandahar province reported a measles vaccination coverage rate of 72%, suggesting similar barriers to access [13]. Additionally, the dropout rate in Ghor was high at 18%, which is worrying and mirrors findings from other studies in the country that have shown an association between high dropout rates and difficulties reaching remote areas [14]. Measles vaccination coverage in Ghor province was lower than the global average (estimated at around 85%). In India, a similar study found vaccination coverage of 87% [15], suggesting that



areas with better health infrastructure and outreach services tend to have higher vaccination coverage. Furthermore, studies in neighboring countries such as Pakistan and Iran have reported higher vaccination coverage. In Pakistan, a vaccination coverage of 82% was reported [16], and in Iran, stronger health systems and vaccination campaigns have led to a significant increase in vaccination coverage, exceeding 90% [17]. These comparisons highlight the impact of health infrastructure, accessibility, and public health policies on vaccination outcomes. The lower coverage rate in winter (65%) compared to other seasons is due to seasonal access barriers, including: B. Frequent weather-related road closures have been reported in remote areas of Afghanistan [18]. This finding is consistent with a similar seasonal pattern in neighboring Pakistan, where vaccination campaigns are often delayed due to harsh winter conditions [16]. The increase in measles vaccination coverage (78%) in 2022 compared to 2020 (73%) and 2021 (75%) indicates positive progress, which is likely due to improved safety and increased establishment of health centers in previously underserved areas. Similar improvements have been seen in other provinces of Afghanistan, where improved security and infrastructure have led to increased vaccination coverage [19]. A similar trend of increased vaccination coverage with increased security has also been seen in parts of Pakistan and Iran, where safety and access to health care have improved significantly [17]. However, despite improvements, certain districts in Ghor still showed coverage rates below 80%, indicating that there is a need for targeted interventions in these areas. The disparities in vaccination coverage between districts such as Ferozkoh, Dollatyar, and Sagher highlight the importance of addressing local barriers, including healthcare access and public awareness, to ensure equitable coverage across all regions. These disparities are similar to those observed in neighboring countries, where regional differences in vaccine uptake have been attributed to varying levels of healthcare infrastructure and public awareness programs [16]. The study relied on secondary data from the DHIS-2 database, which may contain inaccurate information and incomplete records. The scope of the study was limited to 2020-2022, so it was not possible to analyze long-term trends in measles vaccination coverage. Furthermore, socio-cultural factors that influence vaccination intention, such as public trust and perceptions, were not considered. The study also did not assess the quality of the vaccination campaign or specific logistical challenges in its implementation.

## Conclusion

The objective of this study is to investigate measles vaccination coverage in Ghor province in terms of people, place and time. Results indicate that vaccination coverage has improved somewhat but is still below target. Seasonal and geographical variations, high interruption rates and limited access to health services, especially during winter and in underserved areas, pose major challenges. Strengthening mobile vaccination services, expanding health infrastructure and increasing public awareness are needed to address these challenges and improve vaccination coverage in Ghor province.



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