From an Infection to A Catastrophe: A COVID-19 Epidemiological Assessment of the Philippines from January 1 to March 13 of 2022 And 2023

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ABSTRACT

This epidemiological assessment analyzes the COVID-19 situation in the Philippines from January 1 to March 13 of 2022 and January 1 to March 13 of 2023. The study evaluates six epidemiological parameters: incidence, prevalence, total cases, daily deaths, total deaths, and daily case fatality rate. Publicly available data from the Department of Health (DOH), World Health Organization (WHO), Worldometer, and Andra Farm were utilized for comparison. Findings reveal that 2022 recorded significantly higher daily incidence in the thousands compared to 2023, where cases were mostly in the hundreds or below. Prevalence ranged from 17,000 to 291,000 in 2022, while in 2023 it ranged from 8,000 to 13,000. Total cases increased by 823,408 from January 1 to March 13, 2022, compared to only 13,223 during the same period in 2023. A total of 6,065 deaths were recorded from January to March 13, 2022, whereas 820 deaths were recorded during the same period in 2023. The highest daily case fatality rate was 0.75% on January 1, 2022, and 0.67% in 2023. The data demonstrate a marked decline in COVID-19 severity in 2023 compared to 2022, potentially attributed to increased vaccination coverage, improved case management, and adherence to minimum public health standards. Despite declining trends, continued vigilance remains necessary.

Keywords: COVID-19, Philippines, epidemiological trends, incidence, prevalence, case fatality rate

INTRODUCTION

Maintaining a safe and healthy environment is essential to protect individual well-being. The Organization for Economic Co-operation and Development (OECD) states that exposure to both ambient and indoor air pollution elevates the risk of cardiovascular, respiratory, and developmental illnesses, increases premature mortality, and heightens vulnerability to COVID-19.

COVID-19, caused by the novel coronavirus SARS-CoV-2, emerged in Wuhan, China, and rapidly evolved into a global pandemic and public health emergency. The pandemic resulted in millions of confirmed cases worldwide and hundreds of thousands of deaths, generating unprecedented health and economic disruptions. These circumstances underscored the urgency for effective preventive strategies, diagnostic tools, and treatment modalities to reduce the impact of COVID-19 on individuals and communities.

In the Philippines, the pandemic response was shaped by prolonged community quarantine measures, evolving alert level systems, and large-scale public health interventions. The country implemented one of the longest lockdown periods globally, followed by a gradual transition toward reopening by 2023. The Department of Health (DOH) reported that COVID-19 cases significantly declined during this period, coinciding with the waning of the Omicron variant and increasing population immunity. Infectious disease experts noted that while the most severe phase of transmission had subsided, the risk of future surges remained.

By 2023, the Philippines began transitioning toward normalcy following the outbreak in 2020. Educational institutions, public events, and large gatherings resumed operations, although adherence to health protocols remained necessary, especially in crowded environments. The Department of Health (DOH) reported a continued

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decline in COVID-19 cases as epidemiologists observed the reduction of the Omicron subvariant across many regions. Infectious disease expert Dr. Rontgene Solante stated that the most severe phase of the Omicron surge had subsided in most areas, though potential future surges in 2023 remained possible.

A key component of the national response was the expansion of vaccination programs, including primary series and booster campaigns such as Bayanihan, Bakunahan, which substantially increased vaccine coverage. By 2023, a large proportion of the population had received at least one dose, contributing to reduced disease severity and mortality. Improvements in healthcare system capacity, including expanded hospital bed capacity, increased ICU utilization, and strengthened oxygen supply systems, further enhanced the country's ability to manage COVID-19 cases, particularly following the surge experienced in early 2022 (Department of Health [DOH], 2023; Philippine News Agency, 2022; World Health Organization [WHO], 2023).

Despite these improvements, several challenges persisted, including unequal healthcare access, high population density in urban areas, variability in testing practices, and potential underreporting due to self-administered antigen tests (DOH, 2023; WHO, 2023). These factors continue to influence the interpretation of epidemiological data.

Methodological Considerations and Data Validation

To ensure the robustness and reliability of the analysis, several methodological procedures were incorporated. First, data validation procedures were applied to address inconsistencies such as zero-case reporting days, delayed submissions, and batch updates. These anomalies were cross-referenced across multiple sources and interpreted cautiously, as zero values may reflect reporting interruptions rather than true absence of cases (Mathieu et al., 2020).

The study primarily utilized descriptive statistical techniques, including trend observation and comparative analysis across time periods. While no inferential statistical modeling (e.g., regression analysis) was applied, temporal trend comparisons between 2022 and 2023 were systematically examined to strengthen interpretation of epidemiological patterns.

Underreporting was acknowledged as an inherent limitation of COVID-19 surveillance data. The increasing use of self-administered antigen tests, lack of confirmatory RT-PCR testing, and asymptomatic infections likely contributed to underestimation of true incidence and prevalence (WHO, 2023). Global evidence suggests that actual COVID-19 infections may exceed reported cases by several-fold, particularly during periods of reduced testing and high transmission (WHO, 2023; Mathieu et al., 2020). In the Philippines, the Department of Health (DOH) has recognized that many individuals who test positive using home antigen kits are not captured in official reporting systems, and some cases remain untested altogether (DOH, 2023). As a result, the observed declines in incidence and prevalence in 2023 may partially reflect changes in testing behavior and reporting practices, rather than solely true reductions in transmission. These factors were considered in interpreting observed declines, particularly in 2023.

To ensure comparability across years, differences in testing capacity, reporting systems, and healthcare infrastructure were taken into account. Testing rates were generally higher during the 2022 Omicron surge, while reduced testing and reporting intensity in 2023 may partially explain lower recorded case counts (Department of Health [DOH], 2023).

A source triangulation was conducted using data from the Department of Health (DOH), World Health Organization (WHO), Worldometer, and Andra Farm. Discrepancies were resolved by prioritizing official DOH data where available and using other sources for verification and trend consistency.

Lastly, the study acknowledges several methodological limitations, including reliance on secondary data, potential reporting biases, lack of individual-level data, and absence of demographic stratification. These limitations may affect the precision of estimates but do not diminish the overall validity of observed epidemiological trends.

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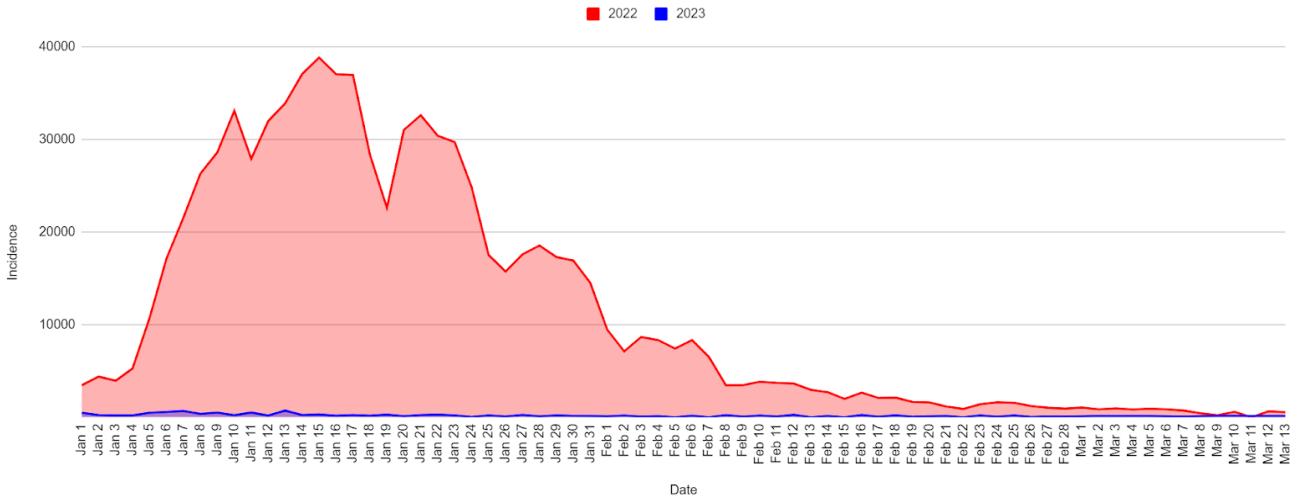
RESULTS AND DISCUSSION

Incidence

Incidence refers to the number of newly reported COVID-19 cases within a defined population over a specified period, serving as a key indicator of ongoing disease transmission and epidemic dynamics. In this study, daily incidence values were derived from reported COVID-19 case counts from January 1 to March 13, 2022, and 2023.

Figure 1. Incidence cases of 2022 and 2023 for dates January 1 to March 13



During 2023, daily incidence ranged from 0 to 730 cases, with 730 cases recorded on January 13, representing the highest daily incidence within the observation period. Conversely, zero cases were reported on February 13, 15, and 22, 2023, reflecting temporary interruptions in reported transmission or potential reporting delays. From January to early February 2023, daily incidence showed a general upward trend interspersed with short-term fluctuations. Around February 5, a notable decline was observed, followed by a further drop on February 7. After this period, incidence gradually increased, reaching a secondary peak around February 12. Following mid-February, daily case counts declined and stabilized, remaining consistently below 180 cases per day from February 17 to March 13, 2023.

Several short-term increases were also documented, notably on February 14 (134 cases), February 16 (251 cases), February 18 (216 cases), and February 23 (209 cases). These episodic rises may reflect localized transmission events, testing variability, or delayed reporting, consistent with observations from Our World in Data regarding reporting lags and batch validation of case records. Overall, the 2023 incidence profile demonstrates substantial day-to-day variability but a general declining trend, indicating effective epidemic control.

In comparison, daily incidence in 2022 was markedly higher, with counts consistently in the thousands, particularly during early January. The incidence curve for 2022 reflects the Omicron-variant-driven surge, characterized by rapid viral transmission and widespread community exposure. Although incidence began to decline toward the latter part of the study period, daily case counts in 2022 remained significantly higher than those observed in 2023.

The stark contrast between the two years highlights a substantial reduction in disease transmission during 2023, likely attributable to expanded vaccination coverage, improved population immunity, strengthened public health interventions, and continued adherence to minimum public health standards, including mask-wearing, physical distancing, and hygiene protocols (Department of Health [DOH], 2023; World Health Organization [WHO], 2023).

In addition, incidence trends in the Philippines are closely linked to testing capacity, reporting practices, and

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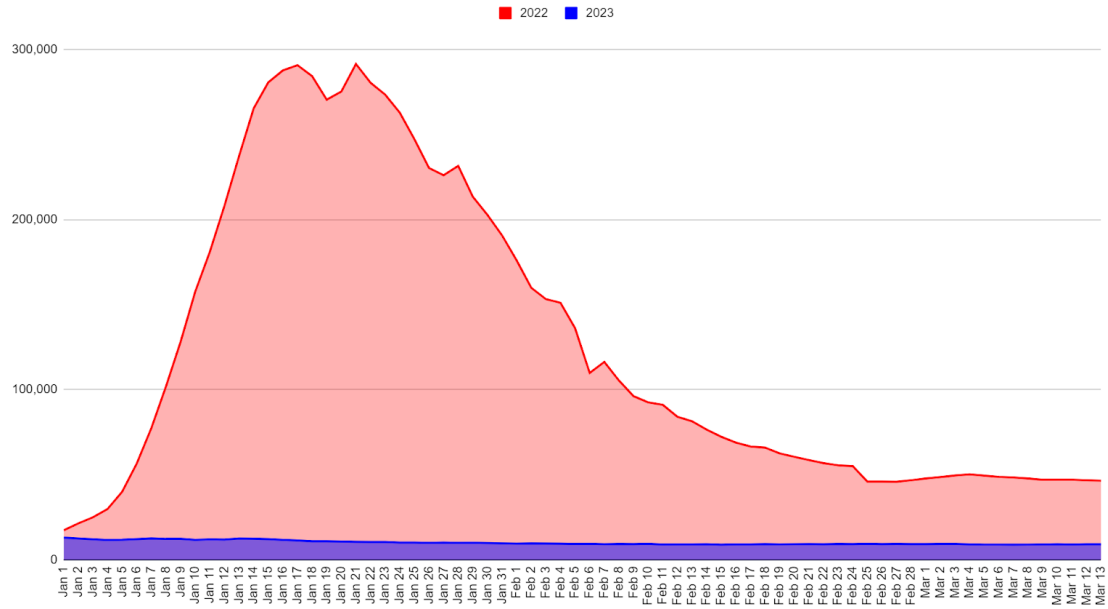
behavioral responses to public health policies. During the January 2022 Omicron surge, the Department of Health (DOH) implemented expanded RT-PCR testing and active case finding, which contributed to higher reported incidence. In contrast, by 2023, testing demand declined significantly due to milder symptoms, increased reliance on self-administered antigen tests, and reduced perceived risk among the population, potentially leading to underestimation of true incidence (DOH, 2023).

Urban centers such as Metro Manila, Cebu, and Davao, characterized by high population density and mobility, historically exhibited higher transmission rates, particularly during surge periods (Department of Health [DOH], 2023; World Health Organization [WHO], 2023). Evidence from Google COVID-19 Community Mobility Reports indicates that increased mobility in retail, workplace, and transit areas in the National Capital Region (NCR) was associated with higher transmission during surge periods, particularly during the Omicron wave.

Prevalence

Prevalence refers to the total number of active COVID-19 cases at a specific point in time, reflecting the current disease burden within the population. Prevalence is influenced by incident cases, recovery rates, and mortality, and may therefore increase or decrease over time.

Figure 2. Prevalence cases of 2022 and 2023 for dates January 1 to March 13



On January 1, 2022, the Philippines recorded 17,378 active cases. This figure rose dramatically, reaching the second-highest peak on January 17, 2022, followed by a slight decline and a subsequent absolute peak on January 21, 2022, with approximately 291,000 active cases. Thereafter, prevalence generally trended downward, with occasional fluctuations, until March 13, 2022.

In contrast, prevalence in 2023 demonstrated a consistently declining pattern. On January 1, 2023, active cases were recorded at 13,806, with a steady decrease observed throughout the study period. From January 30 to March 13, 2023, prevalence stabilized at approximately 9,000 active cases, with minor transient increases observed on February 11, February 15, and March 5–8, 2023.

Comparative analysis reveals a substantial difference in disease burden between the two years, with prevalence ranging from 17,000 to 291,000 cases in 2022, compared to only 8,000 to 13,000 cases in 2023. This dramatic reduction underscores the effectiveness of nationwide vaccination campaigns and public health measures. According to the Embassy of the Philippines, by February 2023, 67,928,954 individuals (60.9% of the population) had received at least one vaccine dose, 62,199,764 (55.7%) were fully vaccinated, and 9,489,120 (8.5%) had received booster doses. Furthermore, the Philippine News Agency reported that 94.5% of the target population had been vaccinated as early as 2023, likely contributing significantly to the observed decline in

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prevalence.

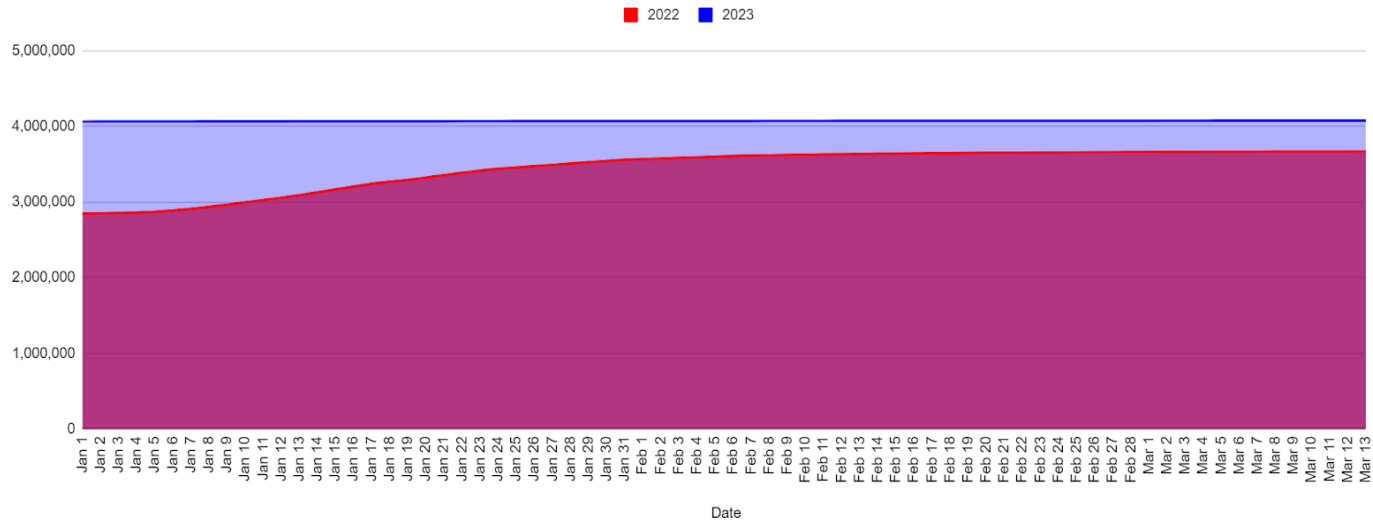
The Department of Health (DOH) cautions that actual prevalence may be underestimated, as many individuals opt for self-testing using antigen kits or forego confirmatory testing, thereby limiting official case reporting. Prevalence trends are also shaped by healthcare system efficiency and recovery rates, as faster clinical recovery and improved case management contribute to reduced active cases. The shorter duration of illness observed in vaccinated populations may have accelerated recovery, thereby lowering prevalence in 2023 (WHO, 2023). Additionally, geographic and socioeconomic disparities may influence prevalence distribution, with densely populated and resource-limited areas potentially experiencing prolonged case persistence due to limited access to healthcare services and isolation facilities (DOH, 2023).

Prevalence patterns in the Philippines are strongly influenced by healthcare access, isolation capacity, and recovery efficiency. During 2022, the surge in active cases strained hospital systems and isolation facilities, particularly in highly urbanized areas, contributing to prolonged case durations and elevated prevalence. By 2023, improvements in home isolation protocols, telemedicine services, and outpatient care facilitated faster recovery and reduced the number of active cases (DOH, 2023).

Geographic disparities also played a role, as regions with limited healthcare infrastructure—such as rural provinces and geographically isolated areas—may have experienced delayed recovery or underreporting of active cases. Furthermore, high vaccination coverage reduced the severity and duration of illness, thereby decreasing the overall number of active infections at any given time (WHO, 2023).

Total Cases

Figure 3. Cumulative cases of 2022 and 2023 for dates January 1 to March 13



Total cases represent the cumulative number of laboratory-confirmed COVID-19 infections, regardless of recovery or mortality. On January 1, 2022, cumulative cases stood at 2,847,331. By March 13, 2022, total cases had risen to 3,670,739, reflecting an increase of 823,408 cases over a 72-day period. This steep rise coincided with the Omicron surge, characterized by high transmissibility and widespread community exposure.

In comparison, cumulative cases in 2023 increased modestly from 4,064,804 on January 1 to 4,078,027 on March 13, corresponding to a net increase of only 13,223 cases. Notably, no increase in cumulative totals occurred on February 14–15 and February 21–22, coinciding with zero reported incidence on these dates.

The markedly slower increase in total cases in 2023 reflects substantial epidemic control, likely driven by high vaccination coverage, improved public health compliance, and strengthened healthcare system preparedness. A direct proportional relationship between daily incidence and total cases is evident, as days with zero incidence corresponded to unchanged cumulative totals, while days with higher incidence resulted in abrupt increases, exemplified by the surge in cumulative cases following February 16, 2023 (251 new cases).

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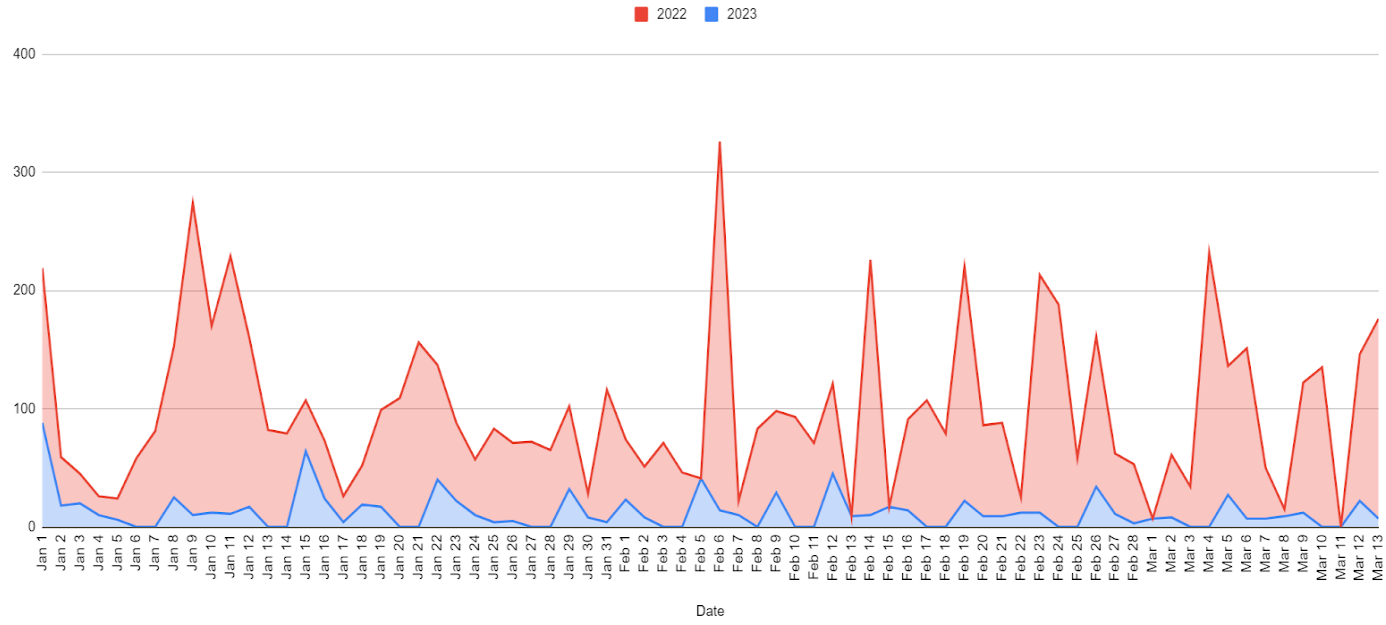
Daily Deaths

Daily deaths represent the number of fatalities attributed to COVID-19 reported per day, serving as a key indicator of disease severity and healthcare system performance. In 2023, daily deaths ranged from 0 to 88, with the highest daily mortality recorded on January 1, 2023, at 88 deaths. From January 1 to January 5, deaths declined from 88 to 6, followed by zero deaths on January 6 and 7. Mortality then rose to 25 deaths on January 8, with fluctuating values between 4 and 20 deaths, culminating in a secondary peak of 64 deaths on January 15. During late January, daily deaths remained variable, reaching a peak of 32 deaths on January 29.

Figure 4. Daily deaths cases of 2022 and 2023 for dates January 1 to March 13



In February, an overall declining trend was observed, with multiple days reporting zero deaths, although isolated increases occurred, including 45 deaths on February 12 and 34 deaths on February 26. March followed a similar pattern, characterized by generally low daily deaths interspersed with minor fluctuations. These irregular patterns likely reflect reporting delays, retrospective data adjustments, and batch updates, consistent with observations from Our World in Data.

By contrast, daily deaths in 2022 were substantially higher, peaking at 264 deaths on January 9, 2022, with consistently elevated mortality throughout the study period and no zero-death days recorded. Both years demonstrated a declining mortality trend from January to March; however, the decline in 2023 was markedly steeper and more sustained. According to the Department of Health (DOH), the lower mortality in 2023 is attributed to reduced incidence of severe disease, enhanced hospital preparedness, improved case management strategies, availability of antiviral therapies, and high vaccination coverage.

Daily mortality trends in the Philippines reflect improvements in healthcare system capacity and clinical management over time. During the 2022 surge, hospitals experienced increased occupancy rates, particularly in intensive care units (ICUs), which may have contributed to higher mortality. In response, the government expanded hospital bed capacity, oxygen supply systems, and workforce deployment, which enhanced the ability to manage severe cases in 2023 (DOH, 2023).

Moreover, the prioritization of high-risk populations, including senior citizens and individuals with comorbidities, in vaccination and booster campaigns significantly reduced mortality risk. The availability of antiviral medications such as molnupiravir and Paxlovid, along with updated clinical treatment protocols, further contributed to improved survival outcomes in 2023. However, reporting delays and retrospective encoding of deaths remain a known issue in the Philippine surveillance system, contributing to observed fluctuations in daily mortality (Mathieu et al., 2020).

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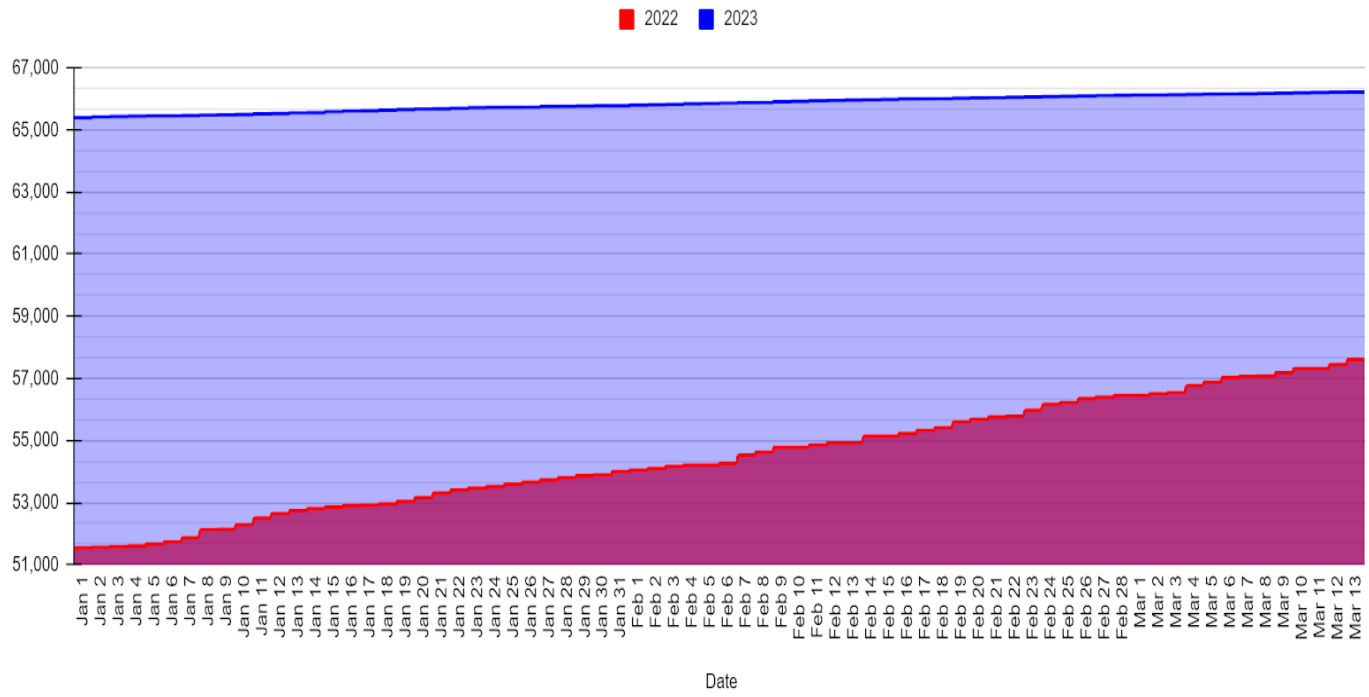
Total Deaths

From January 1 to March 13, 2022, cumulative COVID-19 deaths in the Philippines increased by 6,065, reflecting substantial mortality during the Omicron surge. In contrast, during the same period in 2023, cumulative deaths rose by only 820, with totals increasing from 65,397 to 66,217. This marked reduction in mortality underscores the combined effects of widespread vaccination, improved clinical care, enhanced hospital readiness, and increased public awareness.

Figure 5. Total deaths cases of 2022 and 2023 for dates January 1 to March 13



The higher total deaths in 2022 compared to 2023 can be attributed to the greater severity and rapid spread of COVID-19 during that year. Supporting this, the study "Excess Deaths Associated with the COVID-19 Pandemic in the Philippines" by Kristine Joy S. Briones and Michael Dominic C. del Mundo, in collaboration with UNFPA, indicates that confirmed COVID-19 deaths are only part of the picture. The study also considers deaths among suspected COVID-19 patients who were either untested or received inconclusive results, increased fatalities from other causes due to a weakened healthcare system, deaths of individuals who avoided or were unable to access hospital care or received insufficient funding for treatment, and reductions in deaths from other causes resulting from mobility restrictions.

The reduction in total deaths in the Philippines is indicative of long-term improvements in pandemic response and healthcare system resilience. National vaccination campaigns, including targeted efforts for vulnerable populations through programs such as "Bayanihan, Bakunahan", played a critical role in reducing severe disease and mortality. Additionally, increased public awareness and health-seeking behavior contributed to earlier diagnosis and treatment.

However, excess mortality analyses in the Philippines suggest that official COVID-19 death counts may underestimate the true mortality burden, as deaths occurring outside healthcare facilities or without confirmatory testing may not be fully captured (Briones & del Mundo, n.d.). Socioeconomic barriers, including financial constraints and limited access to healthcare in underserved communities, may have further influenced mortality outcomes.

Comparatively, similar mortality reductions were observed across Southeast Asia, where countries with high vaccination coverage experienced declines in COVID-19-related deaths, reinforcing the regional effectiveness of vaccination strategies (WHO, 2023).

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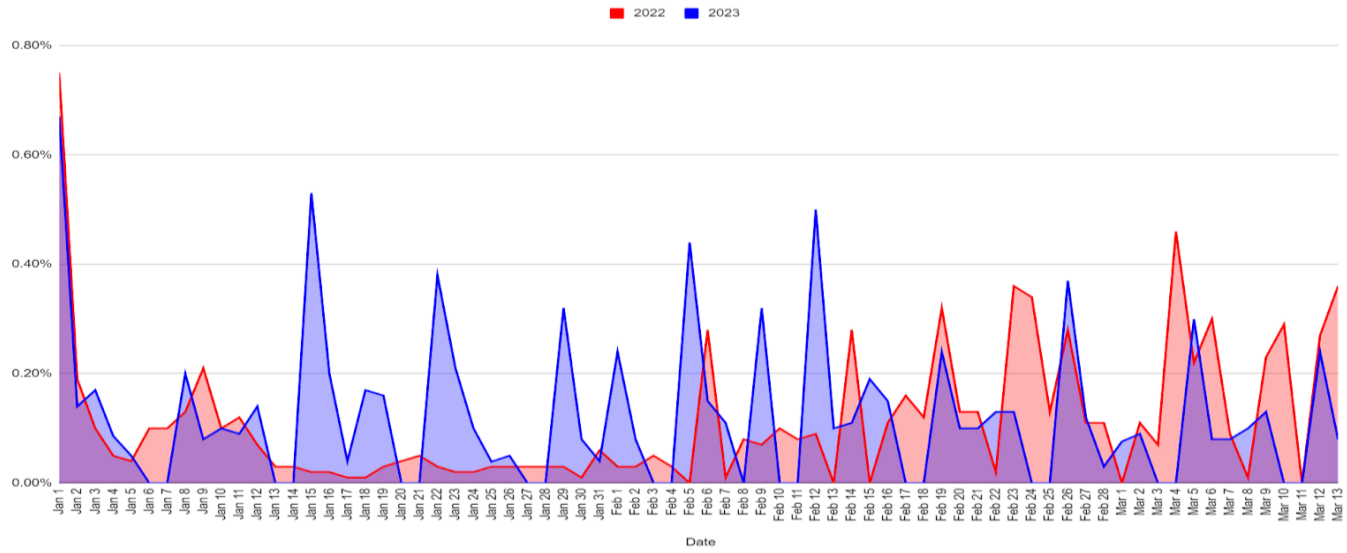
Daily Case Fatality Rate

Figure 6. Daily case fatality rate of 2022 and 2023 for dates January 1 to March 13



The daily case fatality rate (CFR) represents the proportion of daily deaths relative to the number of active COVID-19 cases. In 2023, CFR values ranged from 0% to 0.67%, with the highest rate recorded on January 1, coinciding with the peak daily death count of 88. Several dates reported a CFR of 0%, reflecting days with zero daily mortality.

In comparison, 2022 experienced higher CFR values, reaching 0.75% on January 1, 2022, and maintaining elevated levels throughout much of the study period. Notably, March 4, 2022, recorded 131 deaths, contributing to a high daily CFR. Daily CFR values are inherently influenced by fluctuations in both daily deaths and the number of active cases, resulting in variable patterns. A clear relationship exists between daily deaths and CFR, with higher mortality corresponding to elevated CFR values.

The decline in daily case fatality rate (CFR) in the Philippines reflects improvements in both case detection and clinical outcomes. Expanded vaccination coverage significantly reduced the likelihood of severe disease, thereby lowering mortality relative to the number of detected cases. Additionally, enhanced clinical management protocols, earlier intervention, and increased availability of treatment options contributed to improved patient outcomes (DOH, 2023).

However, CFR estimates in the Philippine context are influenced by testing practices and reporting completeness. Reduced testing in 2023, particularly among asymptomatic individuals, may result in undercounting of total cases, potentially affecting CFR calculations. Furthermore, delays in death reporting may cause temporary fluctuations in daily CFR values (Mathieu et al., 2020). Despite these limitations, the sustained decline in CFR in 2023 highlights the combined impact of vaccination, healthcare system strengthening, and adaptive public health strategies in reducing COVID-19 severity in the Philippines.

CONCLUSION

This comparative epidemiological assessment of COVID-19 in the Philippines from January 1 to March 13, 2022 and 2023 provides a comprehensive evaluation of temporal trends in incidence, prevalence, cumulative cases, daily deaths, total mortality, and daily case fatality rate (CFR), offering critical insights into the evolving dynamics of the pandemic and the effectiveness of public health interventions.

The findings demonstrate a substantial and consistent decline across all epidemiological parameters in 2023 compared with 2022, reflecting marked improvements in pandemic control. In 2022, the Philippines experienced a high-transmission phase dominated by the Omicron variant, characterized by daily incidence consistently in the thousands, peak prevalence approaching 291,000 active cases, cumulative case increases exceeding 823,000

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within 72 days, daily deaths reaching as high as 264, and total deaths amounting to 6,065. These indicators collectively reflected widespread community transmission, significant healthcare system strain, and elevated mortality risk, particularly among vulnerable populations.

In contrast, 2023 exhibited markedly reduced transmission intensity and disease burden. Daily incidence was limited to a maximum of 730 cases, prevalence stabilized between 8,000 and 13,806 active cases, cumulative case increases were restricted to only 13,223, daily deaths ranged from 0 to 88, and total deaths totaled only 820. Additionally, daily CFR values in 2023 consistently remained below 0.67%, compared with higher and more variable CFR values in 2022, signifying improved clinical outcomes and reduced disease severity.

The epidemiological trends observed in this study are influenced by several contextual determinants within the Philippine setting. Demographic factors, including age and comorbidities, play a critical role in COVID-19 outcomes, with older adults and individuals with underlying conditions experiencing higher mortality risk (World Health Organization [WHO], 2023). Although not disaggregated in this study, national reports indicate that severe cases and deaths were disproportionately concentrated among vulnerable populations (Department of Health [DOH], 2023).

Socioeconomic conditions such as population density, poverty, and access to healthcare services also shaped transmission dynamics. Urban centers with high population density, such as Metro Manila, experienced more rapid spread during peak periods, while limited healthcare access in rural and geographically isolated areas may have contributed to delayed diagnosis and treatment (DOH, 2023). In addition, occupational exposure among frontline and service-sector workers further influenced transmission patterns, reflecting underlying socioeconomic disparities.

In terms of policy context, the Philippine government implemented varying levels of community quarantine, vaccination campaigns, and booster rollouts between 2022 and 2023. National programs such as Bayanihan, Bakunahan and the transition to alert level systems facilitated increased vaccine uptake and gradual reopening. Reports indicate that high vaccination coverage and continued adherence to minimum public health standards contributed to declining case numbers despite increased mobility in 2023 (Department of Health [DOH], 2023; Philippine News Agency, 2023).

Healthcare system capacity also significantly improved between the two periods. Enhanced hospital preparedness, expansion of dedicated COVID-19 beds and ICU capacity, improved oxygen supply systems, and the availability of antiviral treatments contributed to reduced mortality and case fatality rates (DOH, 2023; World Health Organization [WHO], 2023; Philippine News Agency, 2022). These improvements strengthened the resilience of the healthcare system and its ability to manage severe cases effectively.

From a regional perspective, trends observed in the Philippines are consistent with patterns across Southeast Asia, where countries experienced high transmission during Omicron waves in 2022 followed by stabilization in 2023 due to vaccination coverage and hybrid immunity (WHO, 2023). This alignment reinforces the broader effectiveness of vaccination and integrated public health strategies across similar settings.

These pronounced improvements can be attributed to the combined effects of extensive nationwide vaccination coverage, booster dose administration, increasing population-level immunity, enhanced diagnostic capacity, improved clinical management protocols, and sustained implementation of minimum public health standards. High vaccine uptake, particularly among high-risk populations, substantially reduced severe disease, hospitalization rates, and mortality, while improved hospital preparedness and treatment availability strengthened healthcare system resilience.

Despite these encouraging trends, persistent challenges remain, including underreporting of mild and asymptomatic cases, reduced confirmatory testing, and reporting delays, which may contribute to underestimation of the true disease burden. In the Philippine context, the increased use of self-administered antigen tests and reduced testing demand in 2023 further complicate accurate case detection (DOH, 2023). Moreover, the potential emergence of novel SARS-CoV-2 variants, waning immunity, and relaxation of public health measures pose ongoing risks for future resurgences, underscoring the need for continued epidemiological

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surveillance and adaptive public health strategies.

Overall, this study underscores the critical role of integrated pandemic response strategies—particularly vaccination, surveillance, healthcare system strengthening, and evidence-based public health interventions—in mitigating the impact of COVID-19. The findings provide valuable epidemiological evidence to guide policy formulation, resource allocation, and preparedness planning, offering a robust framework for managing future infectious disease outbreaks in the Philippines and comparable low- and middle-income country settings.

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