A report on under-five mortality

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What is more tragic than the death of a child aged less than five? In this report, we aim to provide an overview of under-five mortality rate around the world, explain possible reasons for the deaths, and give some recommendations based on the insights. The report is analysed from the perspective of year 2021's data.

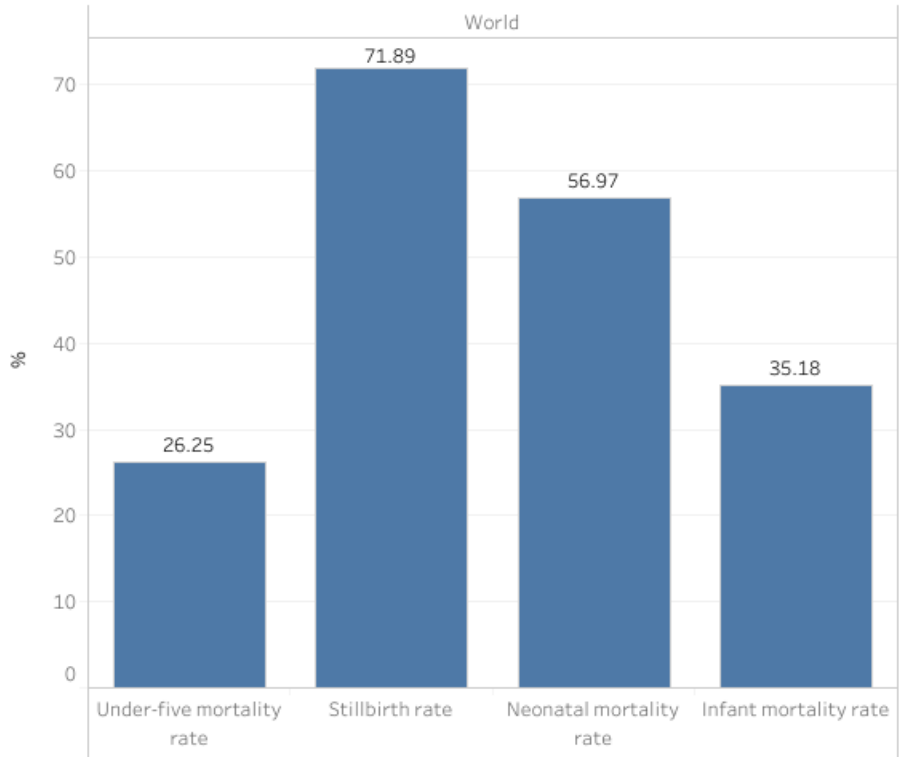
UNDER-FIVE MORTALITY STATUS IN 2021

How many under-five children did the world lose?

More than five million children around the globe died before their fifth birthday in 2021. On average, the world lost 13,791 under-five children every day, 575 every hour, and 10 every minute.

1 in 27	children died before reaching age 5.
1 in 72	died before or during delivery.
1 in 57	newborns died.
1 in 35	children died before reaching age 1.

Under-five mortality rate in 2021



How much progress was made to save under-five lives from 1990 to 2021?

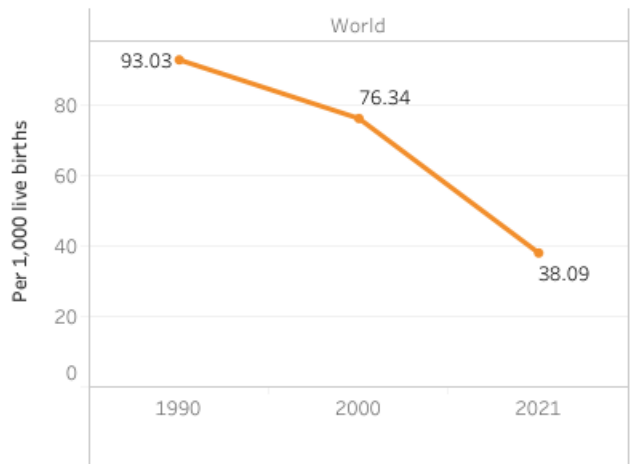
Annual rate of reduction in under-five mortality 2000-2021

Continent	
Africa	3.8%
Asia	4.3%
Central America	3.7%
Europe	3.7%
North America	1.8%
Oceania	2.0%
South America	3.5%

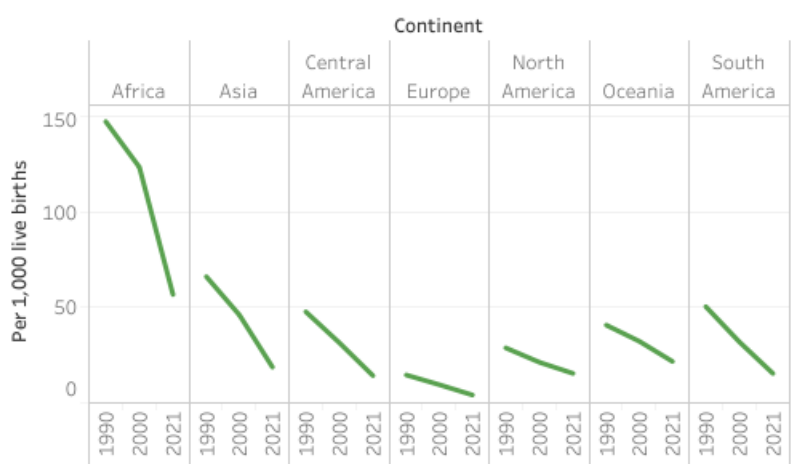
All continents showed positive reduction rate of under-five mortality. Asia topped the list with 4.3% of reduction over the two decades, followed by Africa with 3.8 per cent. The reduction rate of Central America and Europe was only 1 per cent less than that of Africa and 2 per cent more than that of South America. North America and Oceania experienced the slowest reduction at roughly 2 per cent.

Decline of 69 per cent in global under-five mortality rate was witnessed over three last decades between 1990 and 2021. The rate decreased from 93 per 1,000 live births in 1990 to 37 in 2021. More specifically, the decreasing patterns, although different in degree, were also seen in all continents, showing significant concerted efforts of all the countries in preventing under-five mortality.

Under-five mortality rate 1990-2021 in the world



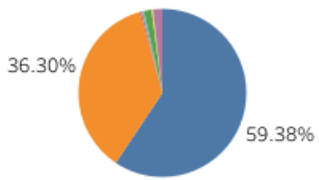
Under-five mortality rate 1990-2021 by continent



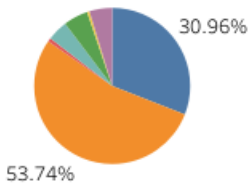
UNDER-FIVE MORTALITY STATUS IN 2021

Where in the world were children most likely to die before age 5?

Under-five mortality incidences



Under-five population distribution

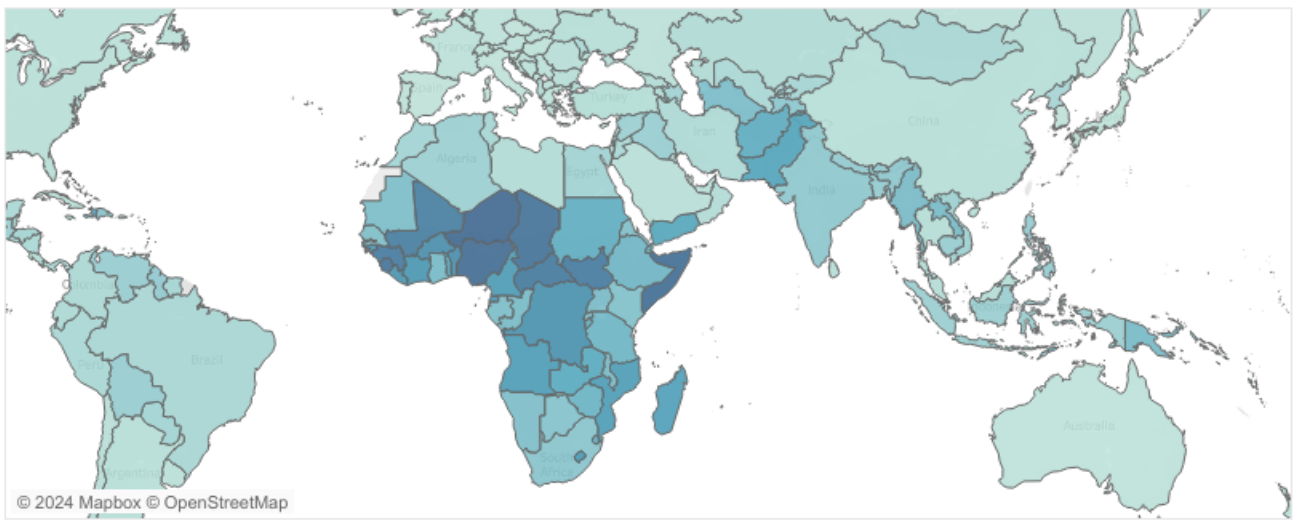


Continent
- Africa
- Asia
- Central America
- Europe
- North America
- Oceania
- South America

Africa accounted for roughly 60 per cent of global under-five deaths while making up for only about 31 per cent of global live under-five births. Asia accounted for another 36 per cent of global under-five deaths and roughly 54 per cent of global live under-five births.

The map shows more specifically that children in sub-Saharan Africa were at highest risk of being dead before reaching age five. The region where there was the second highest risk of death among children under five was Southern Asia.

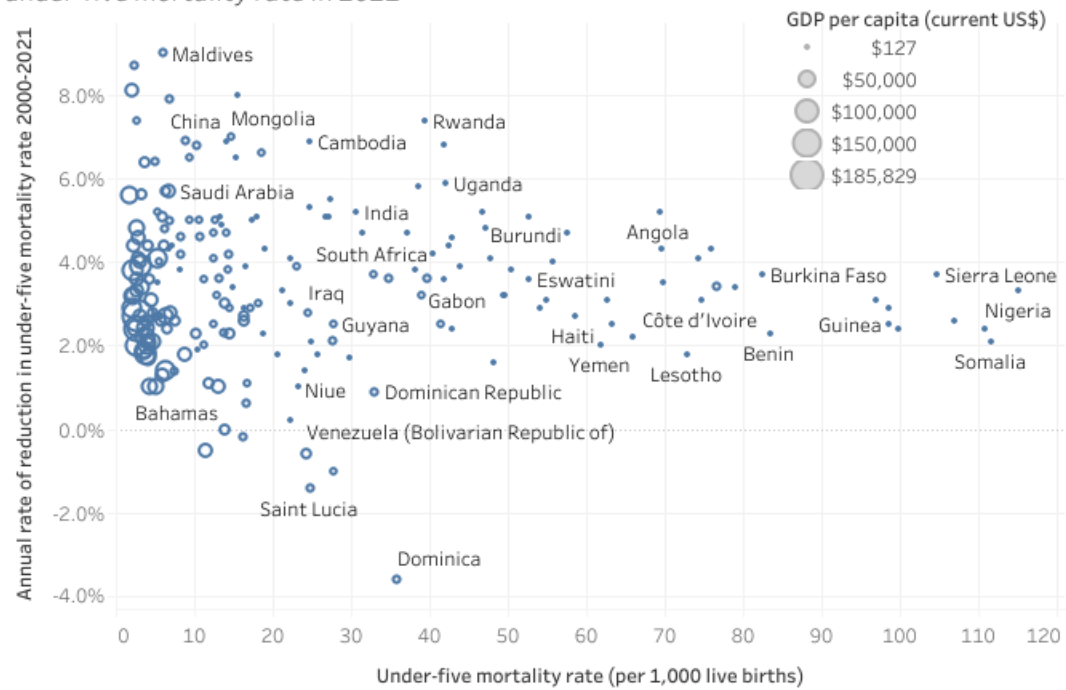
Under-five mortality rate



Under-five mortality rate per 1000

1.7 — 115.2

Annual rate of reduction in under-five mortality rate between 2000 and 2021 vs. under-five mortality rate in 2021



Children faced widespread regional and income disparities in their chances of survival. Children who were born in countries with lowest GDP per capita such as Angola, Liberia, Burkina Faso, Nigeria, Guinea, or Somalia tended to suffered from death. Most of these countries were African countries. Higher-income countries were able to ensure lower under-five mortality rate.

Most countries in the world showed positive yearly rate of reduction in under-five mortality rate from 2000 to 2021. Exceptions were **Grenada**, **Brunei Darussalam**, **Venezuela**, **Fiji**, **Sant Lucia**, and **Dominica**. However, they were at the same time among the countries with lowest under-five mortality rate in the world.

While the burden of under-five mortality was unevenly distributed throughout the world, the positive reduction rate of under-five mortality rate of low-income countries proved that improving child survival was possible even in resource-constrained environments.

UNDER-FIVE MORTALITY STATUS IN 2021

What were the possible leading causes of death among children under five?

There was no data on the distribution of reasons leading to mortality of children aged less than five. However, the raw dataset compiled different factors associated with the **healthy growth of a child**. It is highly likely that failure to satisfying these factors will give rise to increased mortality among children under five years old. The following **four** elements were preassumed to closely relate to under-five mortality.

1) Vaccine coverage

The proportion of children in a region receiving the recommended vaccines

2) Child protection

Protecting children from abuse, and identifying and stopping abuse that might already be happening

3) Nutrition

Eating a regular and balanced diet

4) Ante- and postnatal care

Services provided to mothers (and babies) before, during and after delivery

VACCINE COVERAGE

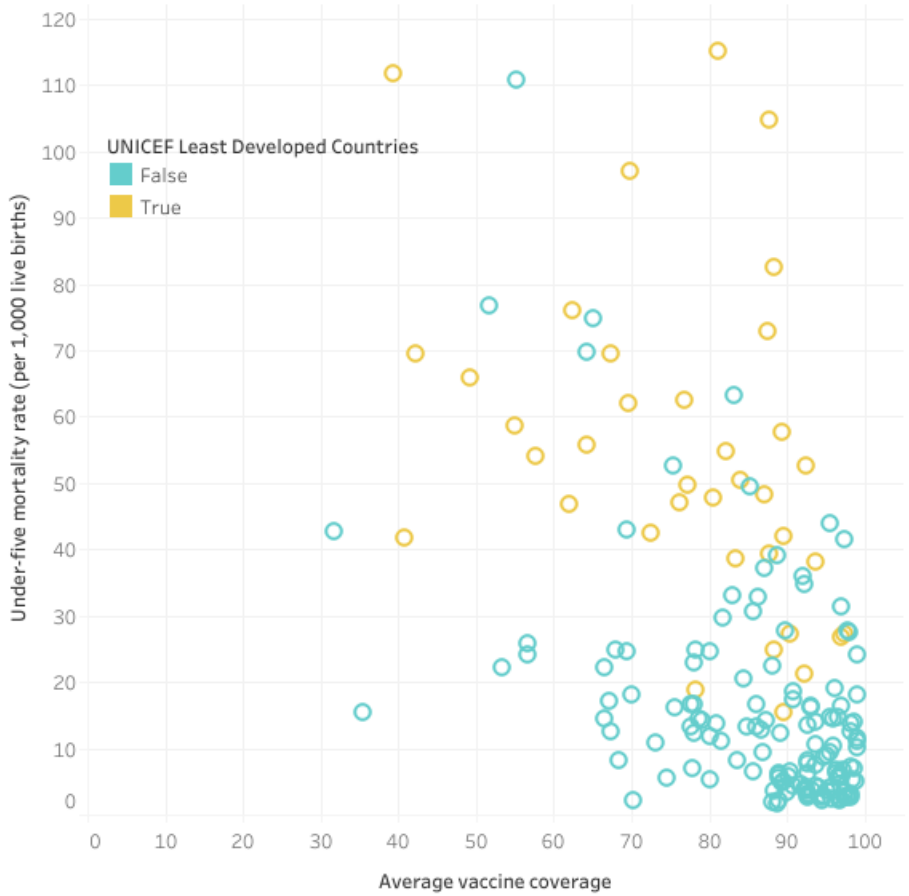
There are huge disparities in vaccine coverage which was closely related with under-five mortality rate.

The data shows an inverse correlation between vaccine coverage and under-five mortality rates. Higher vaccine coverage leads to lower mortality rates, suggesting a significant impact on child deaths.

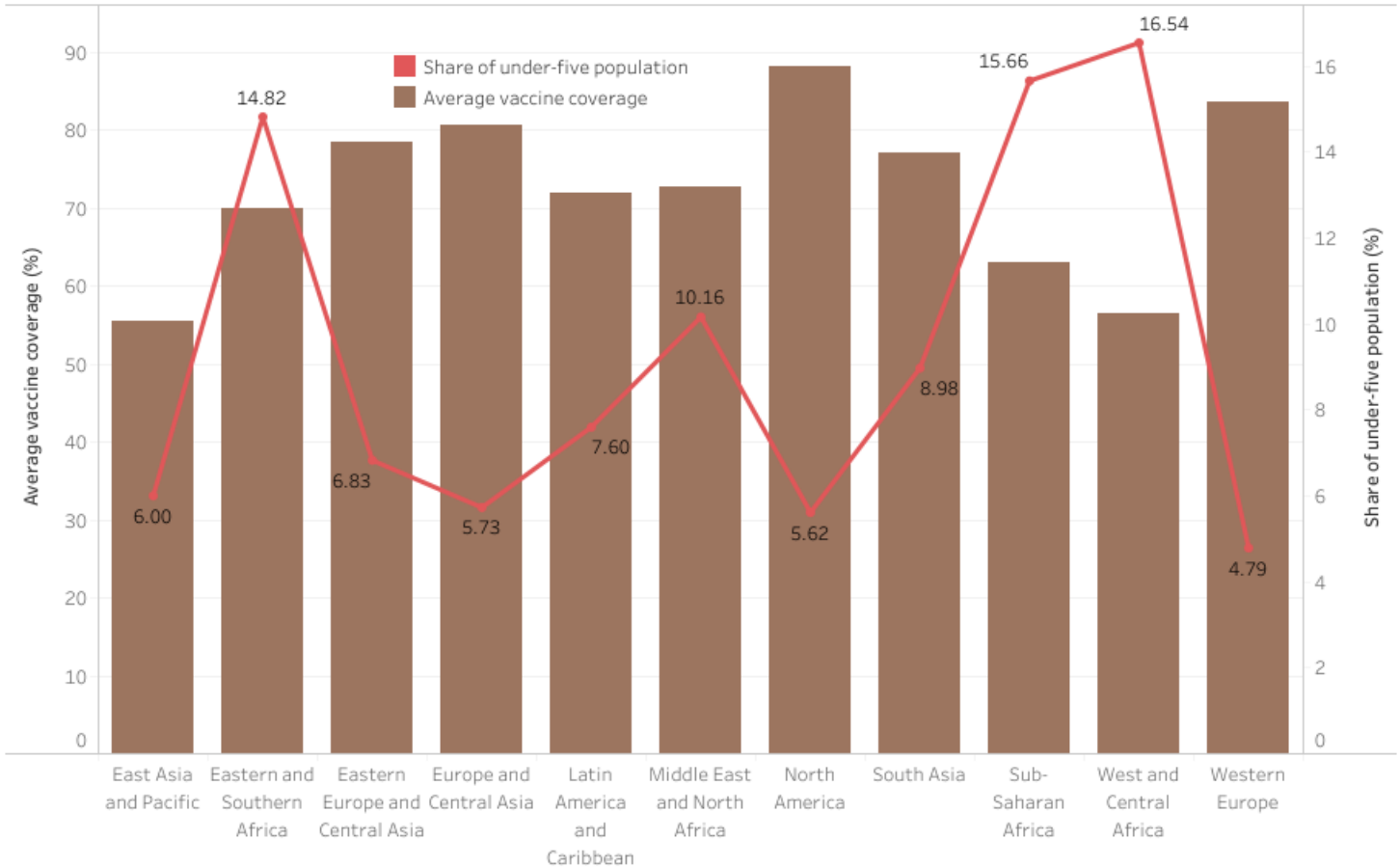
Disparities exist in vaccine coverage across regions. Least developed countries have lower vaccination rates compared to their child population. North America, Western Europe, and Eastern Europe and Central Asia maintain higher coverage levels.

These regional differences contribute to varying mortality rates, especially evident in the least developed countries. Addressing immunisation inequities is crucial for ensuring equitable health outcomes for under-five children worldwide.

Vaccine coverage vs. under-five mortality rate



Regional vaccine coverage vs. under-five population by SDG (Sustainable Development Goals) region



VACCINE COVERAGE

Challenges of low vaccine coverage remain in Africa and Asia.

Several countries in Africa and Asia struggle with low vaccine coverage, below **65** per cent. Notable examples include **Papua New Guinea** (**31.71%**), **North Korea** (**35.43%**), **Somalia** (**39.3%**), **Myanmar** (**40.71%**), **Madagascar** (**49.29%**)

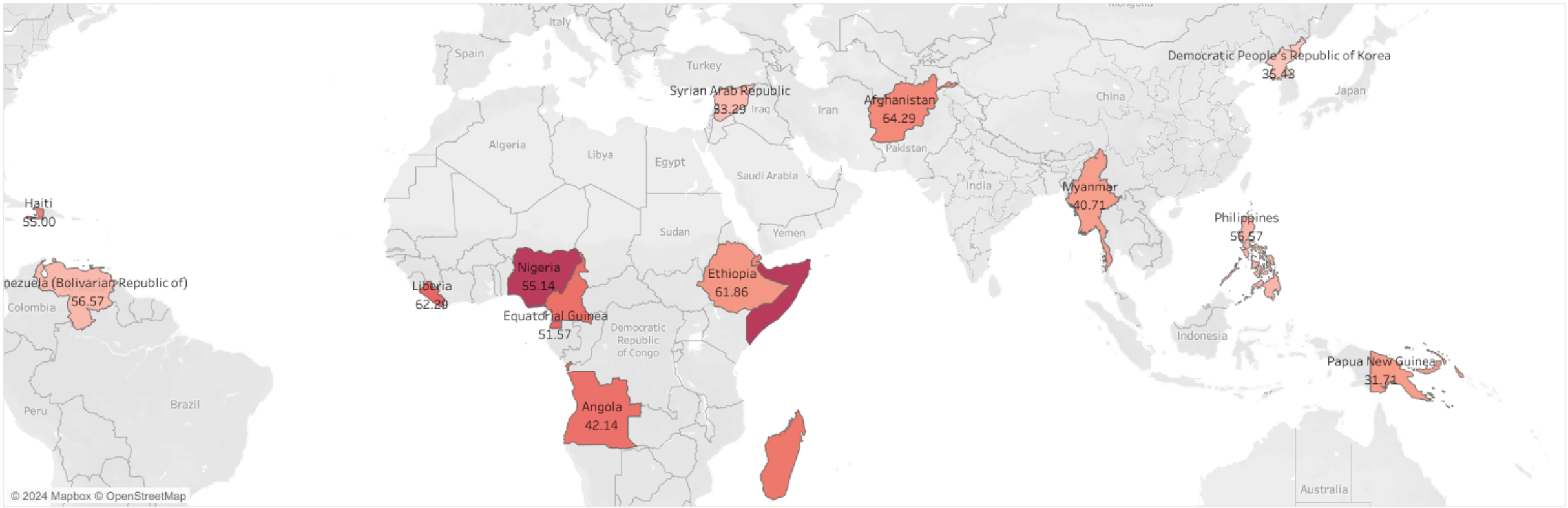
Such countries as **Nigeria**, **Mali**, **Somalia**, **Yemen**, **Afghanistan**, **Madagascar**, and **Myanmar** have a high under-five mortality rates. This combination adds to the challenge of vaccine coverage in these regions.

Prioritising these countries in vaccine programmes could provide more opportunities for children to be vaccinated, potentially reducing under-five mortality rates and improving overall public health.

Under-five mortality rate (per 1,000 live births)

15.40 — 111.78

Under-65% vaccine coverage and under-five mortality rate



CHILD PROTECTION

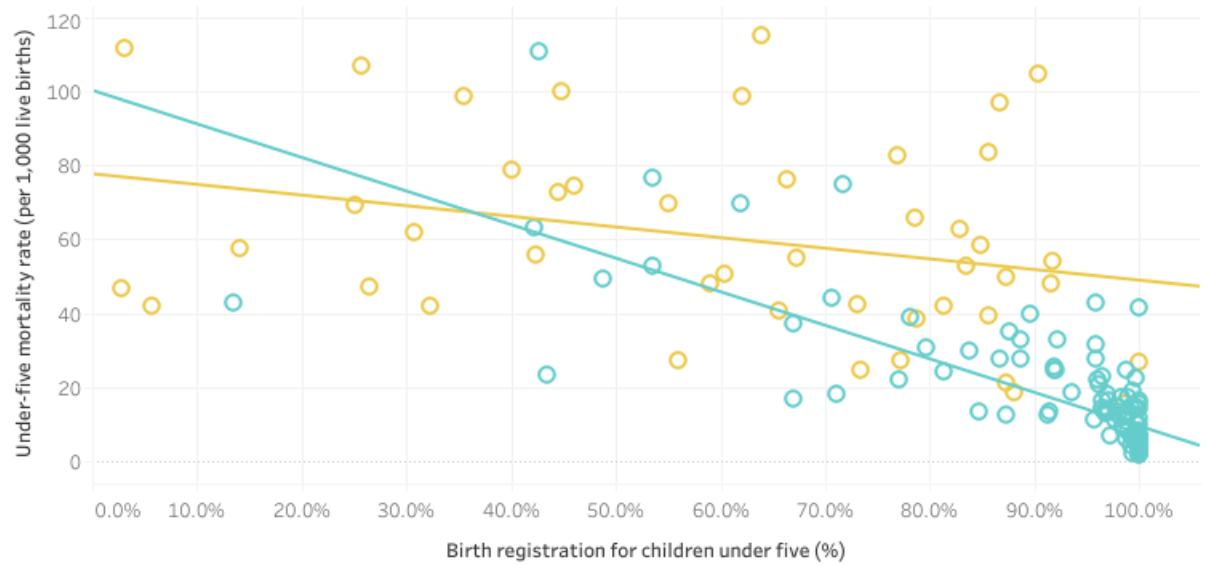
Birth registration is closely related to under-five mortality.

The scatter plot on the right illustrates a close proportional relationship between birth registration and under-five mortality rate. The fact that **not all births of children under five** years old have been registered highlights big problems in **child protection**. Birth registration is crucial for ensuring children's rights, namely access to education, healthcare and protection from abuse. Children whose births are not registered are at risk and vulnerable to abuse. The low registration rate shows the fact that many of the world's children may be missing out on these rights.

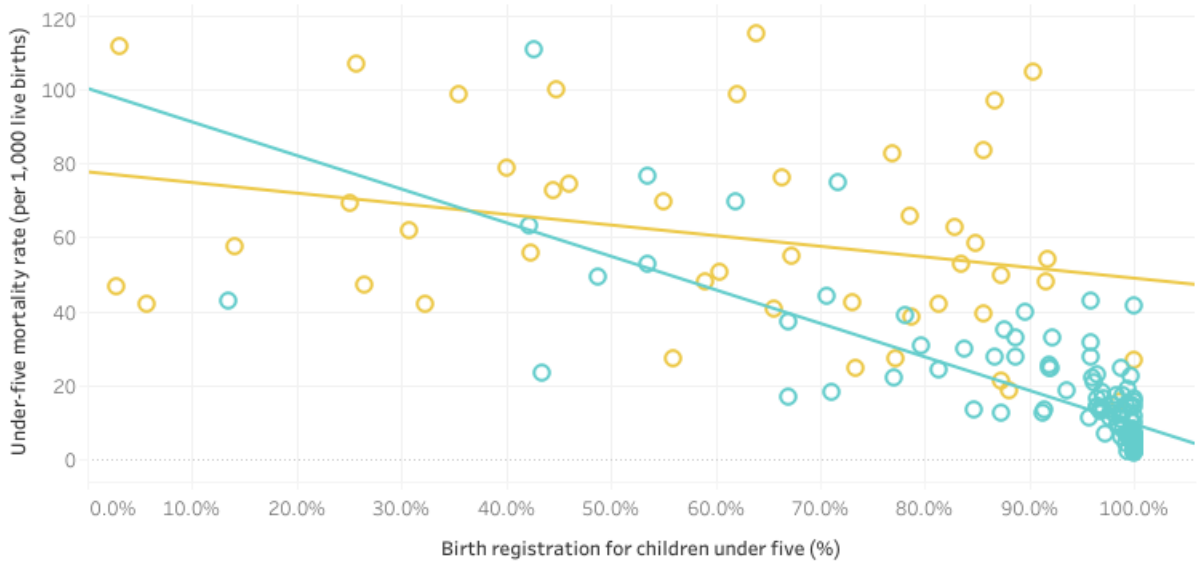
As the map shows, many under-five children in Africa in particular lack these basic rights, with alarmingly low birth registration rates. These regional differences may be due to a number of factors such as lack of awareness of the importance of birth registration, cultural barriers, and limited access to registration services, especially in remote or rural areas.

The scatter plot underneath demonstrates the correlation between low birth registration rates and high fertility rate. It also highlights that the least developed countries have significantly higher fertility rates. High female fertility rate can be caused by many factors, for example socio-economical status, lack of sexual education, socio-cultural norms, and the disadvantaged position of women in society.

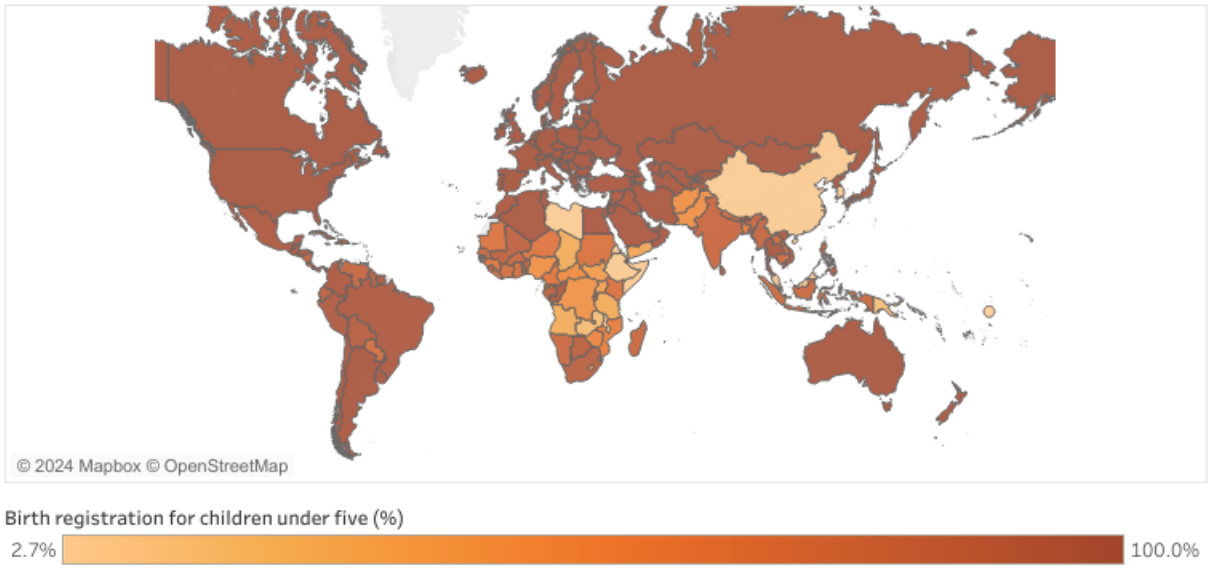
Birth registration vs. under-five mortality rate



Birth registration vs. total fertility



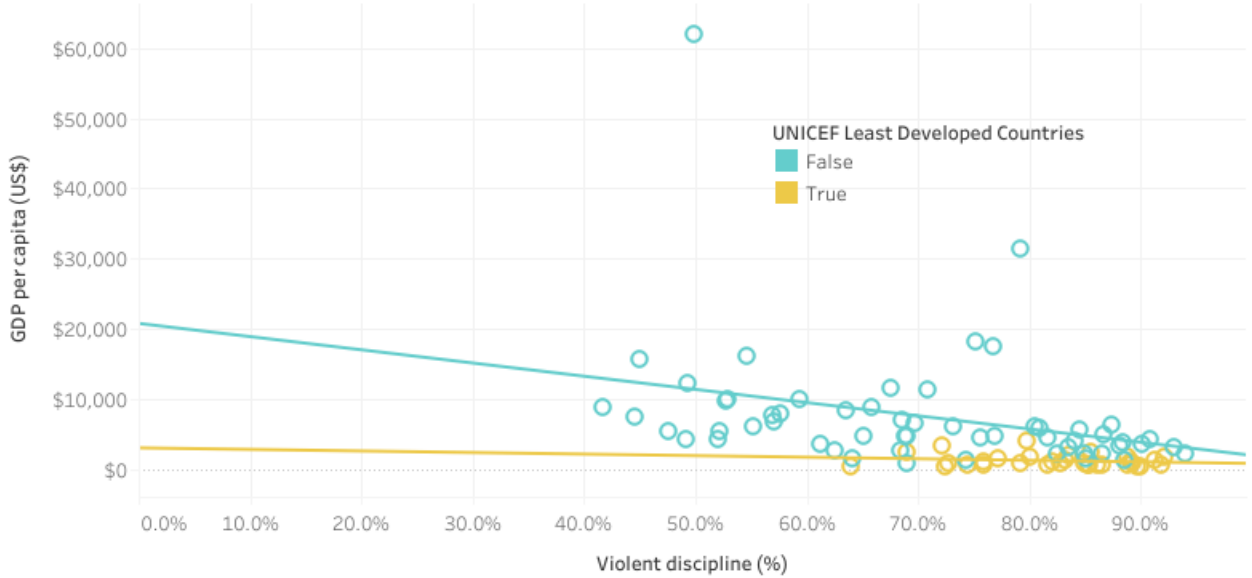
Birth registration of children under five



CHILD PROTECTION

Violence is problematic to child protection, posing further challenges to mitigating under-five mortality.

Violence discipline towards children by GDP per capita



Propotion of children experienced violent discipline during last month

Violent discipline (%)
85.0% 94.0%

Continent	Country	
Africa	Ghana	94.0%
	Egypt	93.0%
	Togo	91.8%
	Benin	91.2%
	Central African Republic	90.0%
	Burundi	89.6%
	Gambia	89.2%
	Guinea	89.1%
	Democratic Republic of the Congo	88.8%
	Eswatini	88.3%
	Tunisia	88.1%
	Sierra Leone	86.5%
	Côte d'Ivoire	86.5%
	Madagascar	86.0%
	Chad	85.3%
	Liberia	85.2%
	Cameroon	85.0%
Asia	State of Palestine	90.1%
	Bangladesh	88.8%
	Syrian Arab Republic	88.5%
Oceania	Kiribati	92.1%
	Samoa	90.8%
	Tonga	86.6%
	Solomon Islands	85.5%
South America	Suriname	87.3%

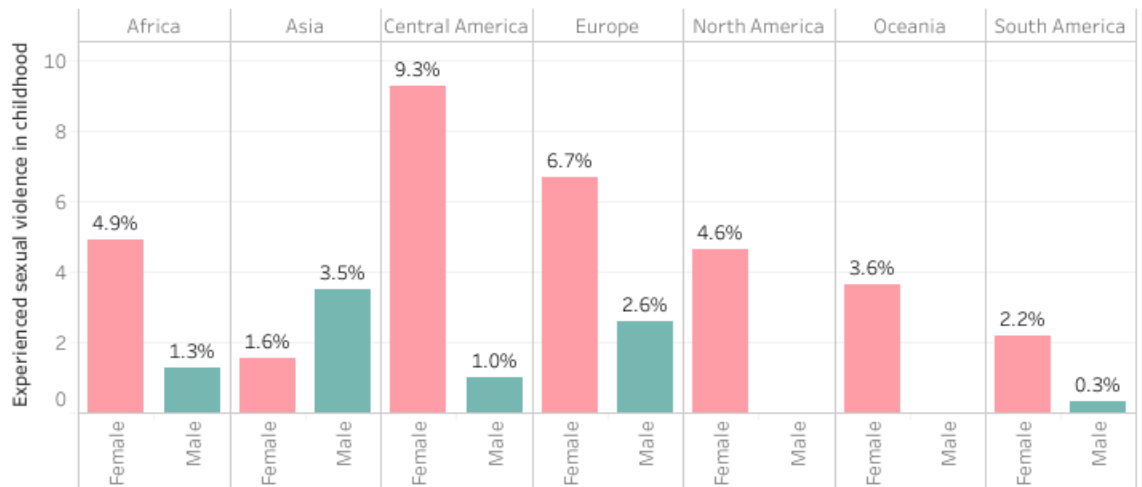
Violent discipline (%)
85.0% to 94.0%

As can be seen from the scatter plot, violence towards children is a huge global problem that has persisted in both high-income and low-income countries. It is also remarkable that children in lower-income countries tend to suffer from more violence. The table on the right corner shows that in many countries, especially in Africa, over 85% of the children experienced violent discipline during the last month.

The bar chart on the right demonstrates the worldwide problem of sexual violence towards children. The chart highlights that girls experienced significantly more sexual violence than boys did. The chart is not complete because there was little information on many continents, especially in Europe. However, it still illustrates that girls in general face significantly more sexual violence than boys do.

Even though these statistics are not directly associated with the under-five mortality rate, they are indicators of the obstacles many countries in the world have been facing when trying to enhance child protection. These obstacles, which require certain resources, pose further challenges to attempts to save children under five worldwide.

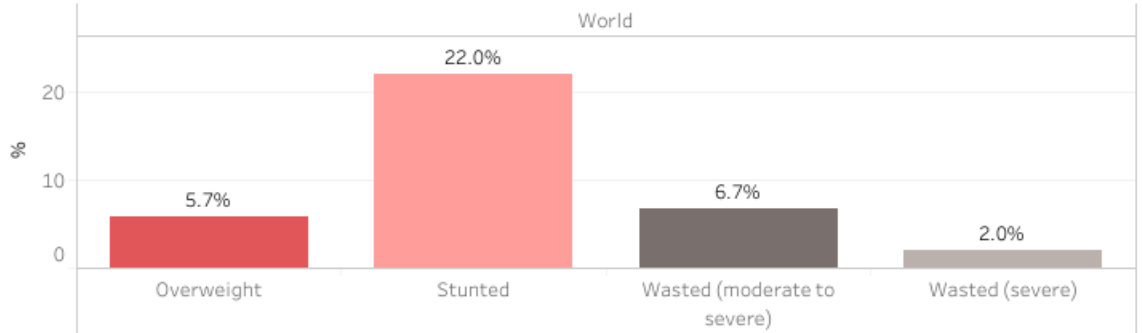
Sexual violence in childhood



NUTRITION

Nutritrion has a significant impact on the survival of children younger than five.

Malnutrition of under-five children



1 in 6	children under five were overweight.
1 in 22	children under five were stunted.
1 in 7	children under five were moderately to severely wasted.
1 in 2	children under five were severely wasted.

The following scatter plots illustrate relationships between under-five mortality rate and several diet-related factors experienced by 6-23-month-olds. In countries where 6-23-month-old babies consumed fewer than 2 food groups, the under-five mortality rate was higher, and in countries where infants consumed at least 5 different food groups, under-five mortality rate was lower. Likewise, in countries where minimum acceptable diet and minimum meal frequency were fulfilled, the under-five mortality rate was correspondingly lower. This could translate into a close correlation between **diverse and sufficient diets** and **health life** of children under five years of age.

In most of the least developed countries (most are in sub-Saharan Africa), only a **neligible** portion of children under age five consumed at least 5 food groups and had minimum acceptable diet as well as meal frequency. This suggests a shortage of decent foods, inducing a serious problem of malnutritrion in these areas.

Under-five mortality rate vs. diet-related elements

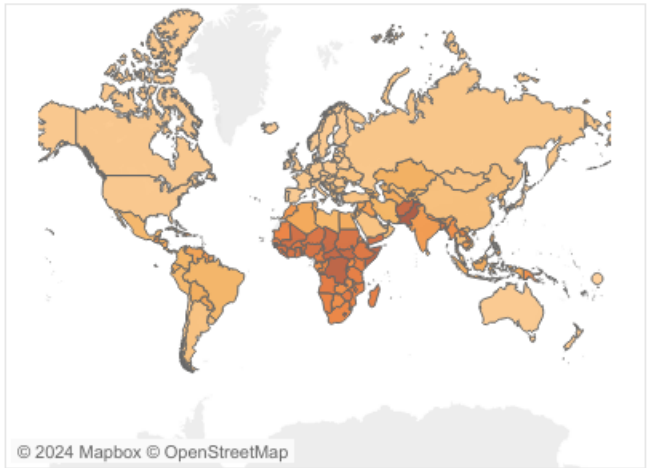
ANTE- AND POSTNATAL CARE

Many of the least developed countries seem to have lacked the practice of institutional delivery and sufferred from a deficient of skilled attendants.

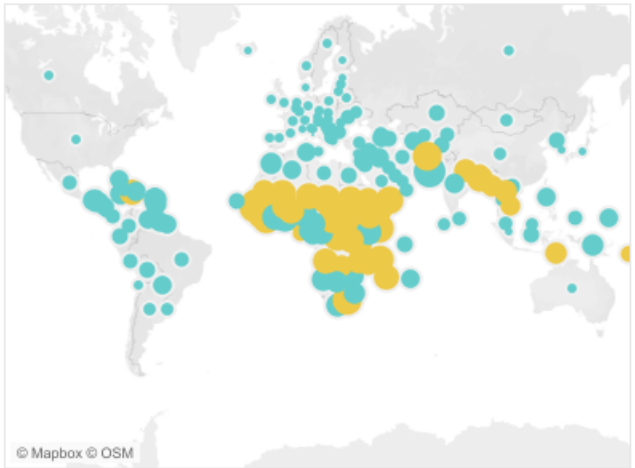
In 2021, stillbirth rate was highest in sub-Saharan African and Southern Asian countries. Many of these countries also happened to belong to the group of the least developed countries.

This stillbirth rate shows an inverse relationship with delivery care. The more birth was delivered in medical institution under the care and supervision of trained health providers (i.e. institutional delivery), the less likely the babies were dead before or during the delivery. Similarly, the more competent the birth attendant, the less likely the babies were dead before or during the delivery.

Stillbirth rate



Stillbirth rate by least developed country

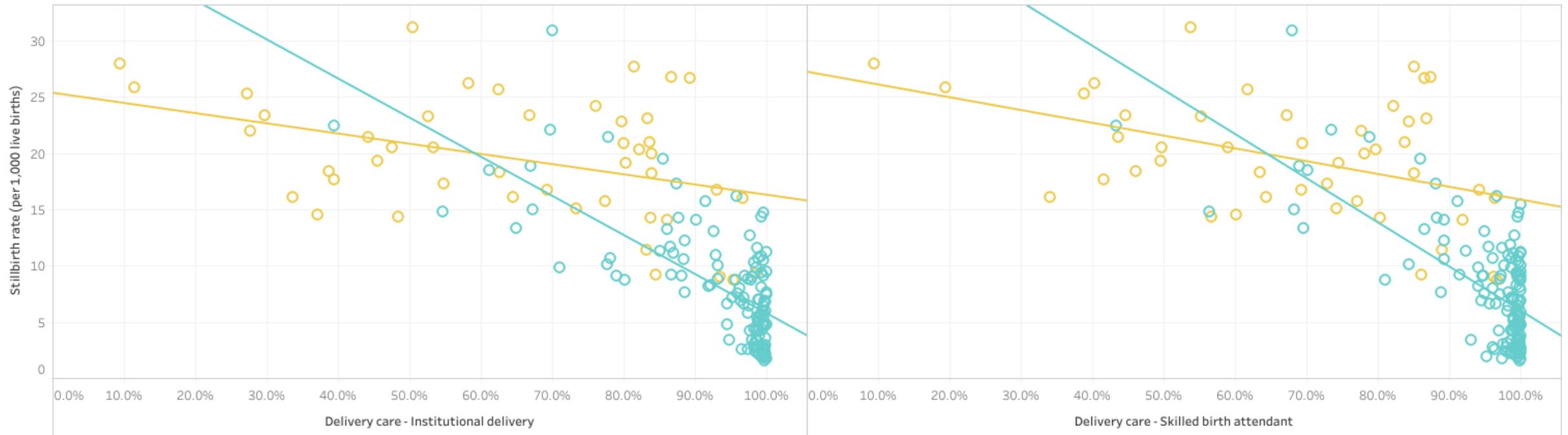


Stillbirth rate (per 1,000 live births)
1.56 31.21

Stillbirth rate (per 1,000 live births)
1.56
10.00
20.00
31.21

UNICEF Least Developed Countries
False
True

Stillbirth rate vs. delivery care



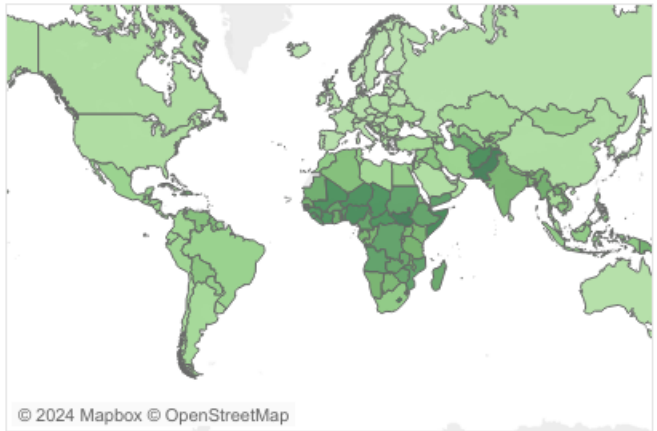
ANTE- AND POSTNATAL CARE

Postnatal checkup for both newborns and mothers plays a crucial role in the the survival of under-five children.

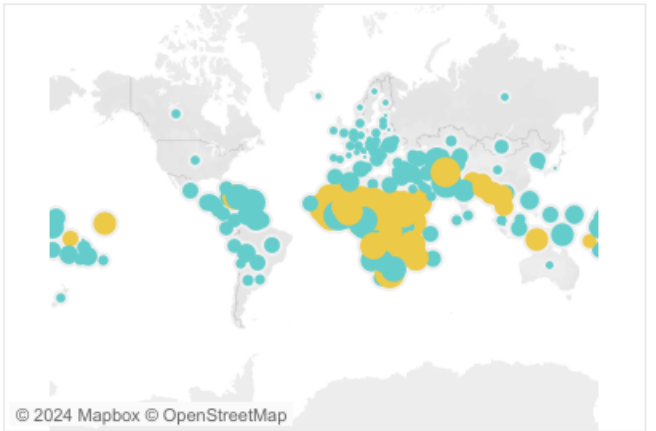
In 2021, neonatal mortality rate was remarkably highest in sub-Saharan African and Southern Asian countries. Many of these countries also happened to belong to the group of the least developed countries.

Postnatal checkup for newborns and mothers was showned to be helpful in preventing the death of under-five children in many countries. However, under-five children in many least developed countries still suffered from a very high risk of death despite fairly regular checkups for both newborns and mothers. This raises a question of reliability of and effectiveness in postnatal services in these countrie..

Neonatal mortality rate



Neonatal mortality rate by least developed country



Neonatal mortality rate (per 1,000 live births)
0.75 39.63

Neonatal mortality rate (per 1,000 live births)
0.75
10.00
20.00
30.00
39.63

UNICEF Least Developed Countries
False
True

Neonatal mortality rate vs. postnatal care

CONCLUSION

What does life look like for children under five in the world today?

1. Continuous progress has led to **fewer children dying** before turning five years old. This is an appropriate moment to reflect on what has been achieved and ponder over what to be done to save more under-five children no matter where they are.

2. Under-five children endure **inequality in survival chances** depending on where they live, their socio-economic background, and whether they live in a fragile and conflict-affected setting.

3. **Sub-Saharan Africa** bears the greatest burden of under-five deaths worldwide, followed by **Southern Asia**. However, progress is possible even in middle-to-low-income countries and resource-constrained environments.

4. More under-five deaths could have been prevented by effective yet often low-cost **necessary interventions** such as access to essential health-care services, births attended by skilled health professionals, access to and use of antenatal and postnatal care services, vaccination, efforts to reduce malnutrition as a risk factor for mortality, or efforts to minimise violence.

What action should be taken next?

1. Continue to **monitor and collect data** from every corner of the world so that current status, future trends or possible challenges can be identified.

2. **Investments** at local, subnational, and national level must be made to ensure proven interventions are available and accessible in every community, particularly where newborns and children at most risk.

3. **Global action** as well as **concerted efforts** is needed to ensure progress.