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Original Research Paper

Medicine

GLOBAL ISSUES IN MEDICINE

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ABSTRACT Medicine is at the heart of global health, but it faces numerous challenges, including the rise of infectious diseases, non-communicable diseases (NCDs), antimicrobial resistance (AMR), healthcare disparities, and climate and environmental changes.Global health is not a discipline; it is, rather, a collection of problems.No single review can do much more than identify the leading problems in applying evidence-based medicine in settings of great poverty or across national boundaries.However, this is a moment of opportunity: only recently, persistent epidemics, improved metrics, and growing interest have been matched by an unprecedented investment in addressing the health problems of poor people in the developing world. This publication examines key global medical issues, their causes, and potential solutions. Addressing these challenges requires international cooperation, policy changes, technological advancements, and equitable healthcare systems.

KEYWORDS :

INTRODUCTION

Global medicine has made significant progress over the past century, reducing mortality rates and improving life expectancy. However, new challenges continue to emerge, affecting populations worldwide. From the COVID-19 pandemic to antibiotic-resistant bacteria and healthcare inequities, the medical community must constantly adapt. This paper discusses major medical issues, explores their global impact, and evaluates potential solutions.

1. Mortality And The Global Burden Of Disease

Refining metrics is an important task for global health: in 1990 the first study took place and laid foundation for the first report on DISEASE CONTROL PRIORITIES in devolping countries and for the world banks 1993 world devolpment report investing in health. Those efforts represented a major advance in the understanding of health status in developing countries. Investing in Health has been especially influential: it familiarized a broad audience with cost-effectiveness analysis for specific health interventions and with the notion of disability-adjusted life years (DALYs). The DALY, which has become a standard measure of the impact of a specific health condition on a population, combines absolute years of life lost and years lost due to disability for incident cases of a condition.(see fig.1 and Table.1 for analysis of the global disease burden by DALYs)

In 2012, the IHME and partner institutions began publishing results from the Global Burden of Diseases, Injuries, and Risk Factors Study 2010 (GBD 2010). GBD 2010 is the most comprehensive effort to date to produce longitudinal, globally complete, and comparable estimates of the burden of diseases, injuries, and risk factors. This report reflects the expansion of the available data on health in the poorest countries and of the capacity to quantify the impact of specific conditions on a population. It measures current levels and recent trends in all major diseases, injuries, and risk factors among 21 regions and for 20 age groups and both sexes. The GBD 2010 team revised and improved the health-state severity weight system, collated published data, and used household surveys to enhance the breadth and accuracy of disease burden data. As analytic methods and data quality improve, important trends can be identified in a comparison of global disease burden estimates from 1990 to 2021.

Global Mortality
Global Burden Of Disease-2010

Of the 52.8 million deaths worldwide in 2010, 24.6% (13 million) were due to communicable diseases, maternal and perinatal conditions, and nutri-tional deficiencies—a marked decrease compared with figures for 1990, when these conditions accounted for 34% of global mortality. Among the fraction of all deaths related to communicable diseases, maternal and perinatal conditions, and nutritional deficiencies, 76% occurred in sub-Saharan Africa and southern Asia. While the proportion of deaths due to these conditions has decreased significantly in the past decade, there has been a dramatic rise in the number of deaths from NCDs, which constituted the top five causes of death in 2010. The leading cause of death among adults in 2010 was ischemic heart disease, accounting for 7.3 million deaths (13.8% of total deaths) worldwide. In high-income countries ischemic heart disease accounted for 17.9% of total deaths, and in developing (low- and middle-income) countries it accounted for 10.1%. It is noteworthy that ischemic heart disease was responsible for just 2.6% of total deaths in sub-Saharan Africa.

In second place—causing 11.1% of global mortality—was cerebrovascular disease, which accounted for 9.9% of deaths in high-income countries, 10.5% in developing countries, and 4.0% in sub-Saharan Africa. Although the third leading cause of death in high-income countries was lung cancer (accounting for 5.6% of all deaths), this condition did not figure among the top 10 causes in low- and middle-income countries. Among the 10 leading causes of death in sub-Saharan Africa, 6 were infectious diseases, with malaria and HIV/AIDS ranking as the dominant con-tributors to disease burden. In high-income countries, however, only one infectious disease—lower respiratory infection—ranked among the top 10 causes of death

The GBD 2010 found that the worldwide mortality figure among children <5 years of age dropped from 16.39 million in 1970 to 11.9 million in 1990 and to 6.8 million in 2010—a decrease that sur- passed predictions. Of childhood deaths in 2010, 3.1 million (40%) occurred in the neonatal period. About one-third of deaths among children <5 years old occurred in southern Asia and almost one-half in sub-Saharan Africa; <1% occurred in high-income countries. The global burden of death due to HIV/AIDS and malaria was on an upward slope until 2004; significant improvements have since been documented. Global deaths from HIV infection fell from 1.7 million in 2006 to 1.5 million in 2010, while malaria deaths

dropped from 1.2 million to 0.98 million over the same period. Despite these improve-ments, malaria and HIV/AIDS continue to be major burdens in partic-ular regions, with global implications. Although it has a minor impact on mortality outside sub-Saharan Africa and Southeast Asia, malaria is the eleventh leading cause of death worldwide. HIV infection ranked thirty-third in global DALYs in 1990 but was the fifth leading cause of disease burden in 2010, with sub-Saharan Africa bearing the vast majority of this burden

The world's population is living longer: global life expectancy has increased significantly over the past 40 years from 58.8 years in 1970 to 70.4 years in 2010.

This demographic change, accompanied by the fact that the prevalence of NCDs increases with age, is dramatically shifting the burden of disease toward NCDs, which have surpassed communicable, maternal, nutritional, and neonatal causes. By 2010, 65.5% of total deaths at all ages and 54% of all DALYs were due to NCDs. Increasingly, the global burden of disease comprises conditions and injuries that cause disability rather than death.

Worldwide, although both life expectancy and years of life lived in good health have risen, years of life lived with disability have also increased.

Despite the higher prevalence of diseases common in older populations (e.g., dementia and musculoskeletal disease) in developed and high-income countries, best estimates from 2010 reveal that disability resulting from cardiovascular diseases, chronic respiratory diseases, and the long-term impact of communicable diseases was greater in low and middle-income countries.

In most developing countries, people lived shorter lives andexper-ienced disability and poor health for a greater proportion of their lives. Indeed, 50% of the global burden of disease occurred in southern Asia and sub-Saharan Africa, which together account for only 35% of the world's population

Global Burden Of Disease -2021

Not only has the pandemic set back healthy longevity worldwide by years, it also reversed the previous trends of shifting disease burden to NCDs. Grouping deaths into three broad categories of causes of death – communicable, maternal, perinatal and nutritional conditions ("communicable diseases" hereafter), NCDs, and injuries – clear transition can be noticed well before the pandemic.

Globally, NCDs accounted for 59.5% of all deaths in 2000, rising to 73.9% in 2019, while the share of communicable diseases dropped from 32.2% in 2000 to 18.2% in 2019, and injuries remained relatively stable around 8%.

As COVID-19 emerged as a new infectious disease and started to take a toll on human lives, the share of deaths due to communicable diseases jumped back to the 2012 level (23.0%) in 2020 and further back to the 2005 level (28.1%) in 2021. Simultaneously, the share of NCD deaths dropped to 69.9% in 2020 and to 65.3% in 2021, and the share of injury deaths dropped to just about 7% in both years(fig.2)

Among WHO regions, the African Region still had the largest share (54.9%) of deaths attributable to communicable diseases before the pandemic, with NCDs accounting for only about 36% of all deaths in 2019. These levels remained largely stable in 2020 and 2021, indicating little impact of the COVID-19 pandemic on the broad distribution of causes of death.

Similarly, the Western Pacific Region has seen limited change since 2019 in the distribution across the three categories, with NCDs accounting for about 88% and communicable diseases for about 6% of all deaths (Fig. 3)

However, the pandemic has been more disruptive to the expected trajectories in other WHO regions. The European Region, which had the highest share of NCD deaths among all deaths in 2019 (89.6%), experienced an abrupt shift of disease burden back to communicable diseases in 2020 and 2021, as the share of NCD deaths dropped to 75.9% in 2021 and the share of communicable diseases nearly quadrupled from 5.3% in 2019 to 20.0% in 2021. Other WHO regions also experienced sizable, reversed shift of disease burden from

NCDs and injuries back to communicable diseases, leading to increases in its share ranging from about 10% (Eastern Mediterranean Region) to 18% (South-East Asia Region)

Similar disparity was also observed across World Bank income groups (Fig. 4). Bearing the largest share (nearly 50%) of deaths due to communicable diseases, low-income countries saw minimal change in the distribution of deaths from the three broad groups between 2019 and 2021. In contrast, NCDs in upper-middle-income and high-income countries were responsible for the largest share of deaths at 84.8% and 88.1%, respectively, in 2019, but these figures dropped by 9.9% and 8.1% between 2019 and 2021 These patterns are the result of a combination of transitioning cause-of-death profiles and changing population structure. Examining age-standardized death rates (ASDR) exhibits more clearly the progress achieved prior to the COVID-19 pandemic and the setback it caused.

Globally, the ASDR from communicable diseases was cut by about half from 244.5 (UI: 155.3–373.9) to 119.3 (UI: 72.8–189.1) per 100 000 population in 2000–2019. Yet, the pandemic brought back the rate to 160.4 (UI: 107.6–237.8) per 100 000 in 2020 and 211.4 (UI: 150.1–300.7) per 100 000 in 2021, representing 34.5% and 77.2% increases from the 2019 baseline.

While the global improvement up to 2019 was primarily driven by the progress in the African Region (56.1% decline), South-East Asia Region (63.3% decline) and Eastern Mediterranean Region (47.4% decline), the Region of the Americas and the European Region were hardest hit by the pandemic in relative terms, with ASDR from communicable diseases more than tripled (3.4 and 3.8 times, respectively) between 2019 and 2021.

The South-East Asia and Eastern Mediterranean regions also saw ASDR from communicable diseases more than doubled in the same period.

In comparison, the African and Western Pacific regions only experienced moderate increases (14.3% and 11.9% increase, respectively).Progress was also made in all WHO regions in 2000–2019 for mortality from NCDs (except for the South-East Asia Region) and mortality from injuries (except for the Eastern Mediterranean Region), leading to 18.8% reduction in ASDR from NCDs and 23.1% reduction in ASDR from injuries globally in 2000–2019. Limited impact was seen in ASDR from these two groups of cause of death in 2019–2021 compared with that from communicable diseases.Similar trends were observed across all World Bank income groups, with sizable reductions observed in ASDR for all three broad cause categories in 2000–2019 and little excess change brought by the pandemic in 2020 and 2021 for NCDs and injuries.

The COVID-19 pandemic reversed the declining trend in ASDR for communicable diseases in all income groups to the extent that the level in 2021 that was above the 2000 level in upper-income countries and nearly double the 2000 level in high-income countries; thus, undoing over two decades of work .

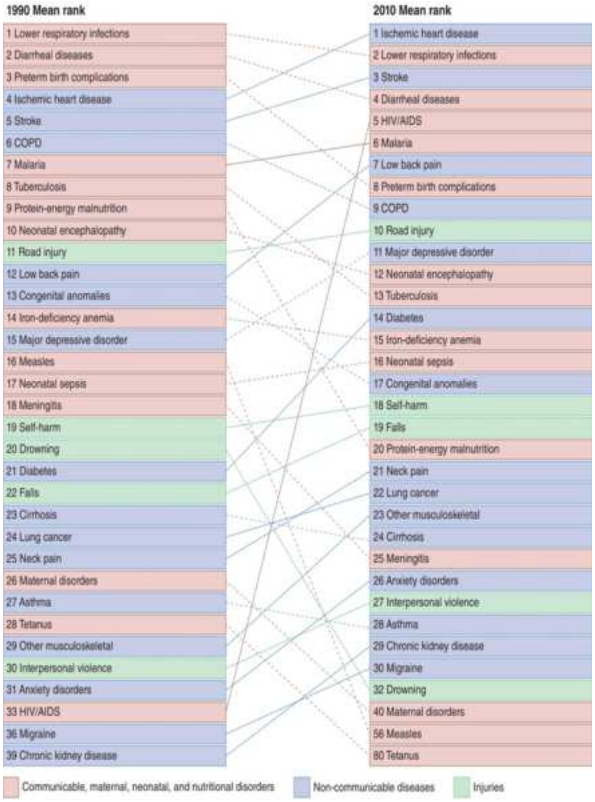

Figure-1 Global DALY (disability-adjusted life year) ranks for the top causes of disease burden in 1990 and 2010.

COPD, chronic obstructive pulmonary disease. (Reproduced with permission from C Murray et al: Disability-adjusted life years [DALYs] for 291 diseases and injuries in 21 regions, 1990–2010: A systematic analysis for the Global Burden of Disease Study 2010. Lancet 380:2197–2223, 2012.)

Table-1 Leading Causes Of Disease Burden,2010

Disease or Injury	DALYs (Millions)	Percent of Total DALYs	Disease or Injury	DALYs (Millions)	Percent of Total DALYs
World			**High-income countries***		
1 Ischemic heart disease	129.8	5.2	1 Ischemic heart disease	21.8	8.2
2 Lower respiratory infections	115.2	4.7	2 Low back pain	17.0	6.4
3 Cerebrovascular disease	102.2	4.1	3 Cerebrovascular disease	11.3	4.2
4 Diarrheal disease	89.5	3.6	4 Major depressive disorder	9.7	3.7
5 HIV/AIDS	81.5	3.3	5 Lung cancer	9.2	3.5
6 Malaria	82.7	3.3	6 COPD	8.6	3.2
7 Low back pain	80.7	3.2	7 Other musculoskeletal disorders	8.2	3.1
8 Preterm birth complications	77.0	3.1	8 Diabetes mellitus	7.3	2.8
9 COPD	76.8	3.1	9 Neck pain	7.2	2.7
10 Road injury	75.5	3.1	10 Falls	6.8	2.5
Developing countries*			**Sub-Saharan Africa**		
1 Lower respiratory infections	109.0	5.2	1 Malaria	76.6	13.3
2 Diarrheal disease	88.0	4.2	2 HIV/AIDS	57.8	10.1
3 Ischemic heart disease	85.5	4.1	3 Lower respiratory infections	43.5	7.6
4 Malaria	82.7	3.9	4 Diarrheal diseases	39.2	6.8
5 Cerebrovascular disease	79.4	3.8	5 Protein-energy malnutrition	22.3	3.9
6 HIV/AIDS	77.0	3.7	6 Preterm birth complications	20.0	3.5
7 Preterm birth complications	74.4	3.5	7 Neonatal sepsis	18.9	3.3
8 Road injury	66.2	3.2	8 Meningitis	16.3	2.8
9 COPD	65.6	3.1	9 Neonatal encephalopathy	14.9	2.6
10 Low back pain	58.4	2.8	10 Road injury	13.8	2.5

The term developing countries refers to low- and middle-income economies. See data. worldbank.org/about/country-classifications.

The World Bank classifies high-income countries as those whose gross national income per capita is $12,476 or more. See data.worldbank.org/about/country-classifications.

Abbreviations: COPD, chronic obstructive pulmonary disease; DALYs, disability-adjusted life years.

Source: Institute for Health Metrics and Evaluation, University of Washington (2013). Data are available through www.healthmetricsandevaluation.org/gbd/visualizations/country.

Table -2 Leading Causes Of Death World Wide,2010

Disease or Injury	Deaths (Millions)	Percent of Total Deaths	Disease or Injury	Deaths (Millions)	Percent of Total Deaths
World			**High-income countries***		
1 Ischemic heart disease	7.3	13.0	1 Ischemic heart disease	1.6	17.9
2 Cerebrovascular disease	5.8	11.1	2 Cerebrovascular disease	0.9	9.9
3 COPD	2.9	5.5	3 Lung cancer	0.5	5.6
4 Lower respiratory infections	2.8	5.3	4 Lower respiratory infections	0.4	4.7
5 Lung cancer	1.5	2.9	5 COPD	0.4	4.5
6 HIV/AIDS	1.5	2.8	6 Alzheimer's and other dementias	0.4	4.0
7 Diarrheal diseases	1.4	2.7	7 Colon and rectum cancers	0.3	3.3
8 Road injury	1.3	2.5	8 Diabetes	0.2	2.6
9 Diabetes	1.3	2.4	9 Other cardiovascular and circulatory diseases	0.2	2.5
10 Tuberculosis	1.2	2.3	10 Chronic kidney disease	0.2	2.0
Developing countries*			**Sub-Saharan Africa**		
1 Cerebrovascular disease	4.2	10.5	1 Malaria	1.1	12.7
2 Ischemic heart disease	4.0	10.1	2 HIV/AIDS	1.0	12.0
3 COPD	2.4	6.1	3 Lower respiratory infections	0.8	9.3
4 Lower respiratory infections	2.3	5.9	4 Diarrheal diseases	0.5	6.6
5 Diarrheal diseases	1.4	3.6	5 Cerebrovascular disease	0.3	4.0
6 HIV/AIDS	1.4	3.4	6 Protein-energy malnutrition	0.3	4.0
7 Malaria	1.2	2.9	7 Tuberculosis	0.3	3.6
8 Road injury	1.2	2.9	8 Road injury	0.2	2.8
9 Tuberculosis	1.1	2.9	9 Preterm birth complications	0.2	2.8
10 Diabetes	1.0	2.6	10 Meningitis	0.2	2.6

The term developing countries refers to low- and middle-income economies. See data.worldbank.org/about/country-classifications. The World Bank classifies high-income countries as those whose gross national income per capita is $12,476 or more. See data.worldbank.org/about/country-classifications.

Abbreviation: COPD, chronic obstructive pulmonary disease.
Source: Institute for Health Metrics and Evaluation, University of Washington (2013). Data available through www.healthmetricsandevaluation.org/gbd/visualizations/country.

2. Risk Factors For Disease Burden And Leading Cause Of Death

The GBD 2010 study found that the three leading risk factors for global disease burden in 2010 were (in order of frequency) high blood pressure, tobacco smoking (including secondhand smoke), and alcohol use—a substantial change from 1990, when childhood undernu-trition was ranked first. Though ranking eighth in 2010, childhood undernutrition remains the leading risk factor for death worldwide among children <5 years of age. In an era that has seen obesity become a major health concern in many developed countries—and the sixth leading risk factor worldwide—the persistence of undernutrition is surely cause for great consternation. Low body weight is still the dominant risk factor for disease burden in sub-Saharan Africa. Inability to feed the hungry reflects many years of failed development projects and must be addressed as a problem of the highest priority. Indeed, no health care initiative, however generously funded, will be effective without adequate nutrition.

In a 2006 publication that examined how specific diseases and injuries are affected by environmental risk, the WHO estimated that roughly one-quarter of the total global burden of disease, one-third of the global disease burden among children, and 23% of all deaths were due to modifiable environmental factors. Many of these factors lead to deaths from infectious diseases; others lead to deathsfrom malignancies. Etiology and nosology are increasingly difficult to parse. As much as 94% of diarrheal disease, which is linked to unsafe drinking water and poor sanitation, can be attributed to environmental factors. Risk factors such as indoor air pollution due to use of solid fuels, exposure to secondhand tobacco smoke, and outdoor air pollution account for 20% of lower respiratory infections in developed countries and for as many as 42% of such infections in developing countries. Various forms of unintentional injury and malaria top the list of health problems to which environmental fac-tors contribute. Some 4 million children die every year from causes related to unhealthy environments, and the number of infant deaths due to environmental factors in developing countries is 12 times that in devolped countries.
The second edition of Disease Control Priorities in Developing Countries, published in 2006, is a document of great breadth and ambition, providing cost-effectiveness analyses for more than 100 interventions and including 21 chapters focused on strategies for strengthening health systems. Cost-effectiveness analyses that com-pare relatively equivalent interventions and facilitate the best choices under constraint are necessary; however, these analyses are often based on an

incomplete knowledge of cost and evolving evidence of effectiveness. As both resources and objectives for global health grow, cost-effectiveness analyses (particularly those based on older evidence) must not hobble the increased worldwide commitment to providing resources and accessible health care services to all who need them. This is why we use the term global health equity. To illustrate these points, it is instructive to look to HIV/AIDS, which in the course of the last three decades has become the world's leading infectious cause of adult death.

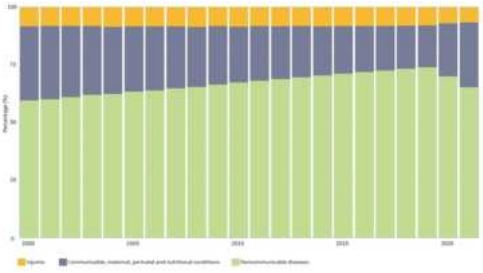

Figure -2 composition of causes of death, global, 2000-2021

Note: In countries that have low-quality vital registration, WHO's current estimates include a cause of death category, "other pandemic-related mortality (OPRM)", which could include underlying causes of deaths from any of the three groups. The graph only shows the relative composition of the three groups; OPRM is not included.

Source: WHO

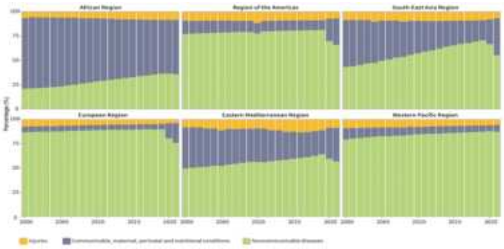

Figure - 3 composition of causes of death, by WHO region, 2000-2021

Note: In countries that have low-quality vital registration, WHO's current estimates include a cause of death category, "other pandemic-related mortality (OPRM)", which could include underlying causes of deaths from any of the three groups. The graph only shows the relative composition of the three groups; OPRM is not included.

Source: WHO

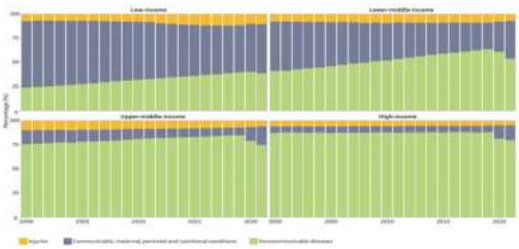

Figure- 4 Composition of causes of death, by World Bank income group, 2000–2021

Note: In countries that have low-quality vital registration, WHO's current estimates include a cause of death category, "other pandemic-related mortality (OPRM)", which could include underlying causes of deaths from any of the three groups. The graph only shows the relative composition of the three groups; OPRM is not included.

Source: WHO

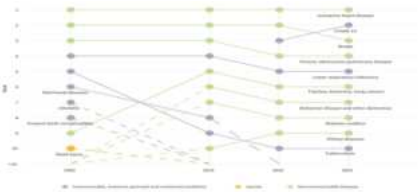

Figure-5 Top 10 causes of death globally in 2000, 2019, 2020 and 2021

Note: Solid lines represent movement within the top 10 causes of death. Dashed lines represent movement in or out of the top 10 causes of death.Source: WHO

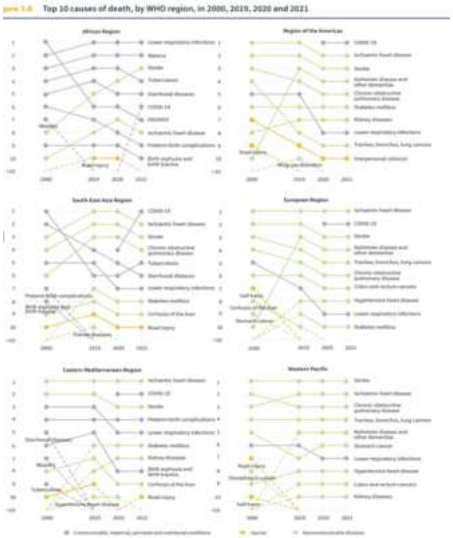

Figure - 6 Top 10 causes of death, by WHO region, in 2000, 2019, 2020 and 2021

Note: Solid lines represent movement within the top 10 causes of death. Dashed lines represent movement in or out of the top 10 causes of death.

Source: WHO

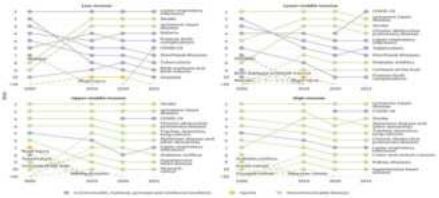

Figure-7 Top 10 causes of death, by World Bank income group, in 2000, 2019, 2020 and 2021

Note: Solid lines represent movement within the top 10 causes of death. Dashed lines represent movement in or out of the top 10 causes of death.

Source: WHO

3.Major Global issues in Medicine

3.1 . Infectious Diseases and Pandemics

Despite medical advancements, infectious diseases remain a significant global threat. The emergence of new viruses and bacteria, coupled with increasing globalization, makes disease outbreaks more frequent and severe.

Key Concerns :-

3.1.1 Covid 19 Pandemic

The SARS-CoV-2 virus exposed weaknesses in healthcare systems worldwide. It highlighted the need for pandemic preparedness, rapid vaccine development, and better

international coordination.

The COVID-19 pandemic had a profound impact on the field of medicine globally, affecting healthcare systems, medical research, and public health policies.

Impacts Of Covid 19 As Global Issue

Healthcare System Strain

Overburdened Hospitals: ICUs and emergency departments were overwhelmed with COVID-19 patients, leading to shortages of beds, ventilators, and oxygen supplies.

- **Healthcare Worker Burnout:** Medical professionals faced extreme physical and mental stress, leading to workforce shortages.
- **Delayed Medical Care:** Many non-urgent medical procedures and routine check-ups were postponed, worsening chronic conditions and cancer diagnoses.

- **Medical Research & Vaccine Development**

Rapid vaccine development: mRNA vaccines (Pfizer-BioNTech, Moderna) were developed in record time, revolutionizing vaccine science.

- **Emergency use authorizations (EUA):** Regulatory bodies like the FDA and EMA expedited approvals for COVID-19 treatments and vaccines.
- **Long COVID research:** Studies emerged on long-term symptoms, prompting new treatment approaches.

- **Pharmaceutical & Drug Supply Chain Issues**

Medicine shortages: Lockdowns and supply chain disruptions led to global shortages of essential medicines, including antibiotics and sedatives.

- **Vaccine Inequity:** Wealthier countries received vaccines faster, while low-income nations struggled with access, prompting initiatives like COVAX.

- **Public Health Challenges**

Misinformation: The spread of false information about vaccines and treatments made public health messaging difficult.

- **Vaccine hesitancy:** Despite scientific evidence, many refused vaccines, prolonging the pandemic in some regions.
- **New treatment protocols:** Doctors experimented with treatments like Remdesivir, monoclonal antibodies, and steroids to manage severe cases.

- **Digital & Telemedicine Boom**

Expansion of telehealth: Virtual consultations became the norm, improving healthcare access for many.

- **AI in diagnostics:** Machine learning models were used to detect COVID-19 in X-rays and predict outbreaks.

- **Global Policy Changes**

Strengthened pandemic preparedness: Governments started investing more in future pandemic response plans.

- **New vaccine technology regulations:** mRNA and other novel vaccine platforms saw increased investment for other diseases like influenza and HIV.
- The COVID-19 pandemic reshaped medicine, accelerating innovation but also highlighting major vulnerabilities in global healthcare systems.

Health Statistics Of Covid 19

The COVID-19 pandemic led to significant health impacts worldwide, with millions of infections and deaths. Here are some key health statistics related to COVID-19:

Global COVID-19 Cases & Deaths

Total reported cases: Over **770 million** confirmed cases (as of late 2023).

- **Total Deaths:** Approximately **7 million** confirmed deaths worldwide.
- **Case fatality rate (CFR):** Estimated between **1-3%**, varying by country and healthcare quality.
- **Hospitalization & ICU Admissions**

Hospitalization rate: About **5-15%** of confirmed cases required hospitalization.

- **ICU Admission Rate:** Around **2-5%** of hospitalized patients needed intensive care.
- **Ventilator Use:** Patients with severe respiratory failure often needed mechanical ventilation, with high mortality among ventilated patients.

- **Vaccine Statistics**

Total Vaccines Administered: Over **13 billion** doses worldwide.

- **Global vaccination rate:** Around **70%** of the world's population received at least one dose.
- **Effectiveness:** Vaccines reduced severe illness and death by **80-95%**, especially with booster doses.

- **Long COVID Cases**

Prevalence: Estimated **10-30%** of infected individuals developed long

COVID Symptoms Lasting Weeks To Months.

- **Common Symptoms:** Fatigue, brain fog, shortness of breath, joint pain, and heart complications.

- **Health Disparities**

Higher mortality in elderly: 80%+ of deaths occurred in people over 60 years old.

- **Racial and socioeconomic disparities:** Minority and lower-income communities had higher infection and death rates due to healthcare access issues.
- **Impact on chronic disease patients:** People with diabetes, heart disease, or obesity faced higher hospitalization and death risks.

Mental Health Impact

- **Rise in depression & anxiety:** Cases increased by **25% globally** due to stress, isolation, and economic struggles.
- **Healthcare worker burnout:** High stress led to mental health crises among frontline workers.

Solutions:

Addressing COVID-19 as a global issue in medicine requires a **multi-faceted approach** that includes public health strategies, medical advancements, and international cooperation. Here are key solutions:

Strengthening Healthcare Systems

Increase hospital capacity by expanding ICUs, ventilator availability, and emergency medical services.

- **Improve healthcare worker support** through better wages, mental health programs, and training.
- **Enhance global medical supply chains** to prevent shortages of critical drugs and equipment.
- **Advancing Vaccine Development & Distribution**

Boost vaccine equity by ensuring fair distribution through initiatives like COVAX.

- **Develop universal coronavirus vaccines** to protect against future variants.
- **Encourage booster shots** and update vaccines regularly for emerging strains.

Expanding Treatment Options

- **Invest in antiviral drugs** (like Paxlovid and Remdesivir) to reduce severity.
- **Improve access to monoclonal antibodies** for high-risk patients.

- **Develop personalized medicine approaches** to tailor treatment based on patient risk factors.

- **Strengthening Public Health Policies**

Enhance global pandemic preparedness with better surveillance and response plans.
- **Improve early detection systems** for new virus variants and outbreaks.
- **Mandate health safety measures** (masking, social distancing) during high-risk periods.

- **Combating Misinformation & Increasing Public Awareness**

Promote science-based health campaigns to encourage vaccination and preventive measures.
- **Regulate misinformation online** to prevent the spread of false COVID-19 treatments.
- **Increase transparency** in government and WHO communications to build public trust.

- **Advancing Telemedicine & Digital Health Solutions**

Expand telehealth services to improve access to medical care remotely.
- **Use AI & big data** to predict outbreaks and improve healthcare decision-making.
- **Integrate electronic health records (EHRs)** to track patient care efficiently.

- **Strengthening International Cooperation**

Improve global health funding to support lower-income countries.
- **Encourage knowledge sharing** between nations on COVID-19 treatments and vaccines.
- **Ensure WHO and international health organizations have more authority** to enforce pandemic responses.
- By implementing these solutions, the world can better manage COVID-19 and prepare for future pandemics.

3.1.2 HIV/AIDS

Impacts of hIV as global issue HIV remains a major global health issue, significantly affecting medicine and public health. Its impacts include:

High Morbidity And Mortality

Over **39 million people** live with HIV worldwide, with millions of new infections annually.
- Without treatment, HIV progresses to **AIDS**, leading to severe immune system failure and opportunistic infections.

- **Healthcare System Burden**

HIV requires **lifelong antiretroviral therapy (ART)**, increasing pressure on healthcare systems, especially in low-income countries.
- High costs for ART, monitoring, and hospitalizations strain resources.

- **Co-Infections and Comorbidities**

HIV weakens the immune system, increasing susceptibility to **tuberculosis (TB), hepatitis, and other infections**.
- It raises the risk of **cardiovascular diseases, cancers, and mental health disorders**.

- **Drug Resistance and Treatment Challenges**

Some HIV strains have developed **resistance to antiretroviral drugs**, making treatment less effective.
- Patients must strictly adhere to treatment to prevent resistance.

- **Stigma and Social Impacts**

People living with HIV often face **discrimination**, affecting mental health, employment, and access to healthcare.
- Misinformation and stigma hinder prevention and early treatment.

- **Mother-to-Child Transmission**

Without treatment, **HIV can be passed from mother to child** during

Health Statistics Of HIV

At the end of 2022, there were an estimated 39.0 million (UI: 33.1–45.7 million) people living with HIV globally, of which 37.5 million (UI: 31.8–43.6 million) were aged 15 years or older and 1.5 million (UI: 1.2–2.1 million) were children aged under 15 years .

In 2022, there were 1.3 million (UI: 1.0–1.7 million) new HIV infections globally. This represents a 54% reduction from 2.8 million (UI: 2.2–3.8 million) in 2000, and 27% from 1.8 million (UI: 1.4–2.4 million) in 2015. The global HIV incidence rate (number of new HIV infections per 1000 uninfected population, SDG indicator 3.3.1) was 0.17 (UI: 0.13–0.23) in 2022, a 32% reduction from 0.25 (UI: 0.19–0.33) in 2015. However, progress varied across regions. The Eastern Mediterranean Region has seen a 45% increase in HIV incidence rate since 2015, although it still had the lowest number of new infections across WHO regions in 2022. HIV incidence rate declined by 31% during the same period in the South-East Asia Region, where both incidence rate and number are among the lowest. Despite impressive progress in reducing incidence, the African Region continued to bear the heaviest HIV burden (Fig.8)

Global initiatives call for curbing the number of new HIV infections to 370 000 in 2025 and 335 000 in 2030, equivalent to HIV incidence rates of 0.05 in 2025 and 0.025 in 2030 (4, 5). The latest estimates suggest that while the world is moving in the right direction, it is still far from reaching these targets.

Despite progress, 39 million people globally live with HIV, and access to antiretroviral therapy remains limited in low-income regions.

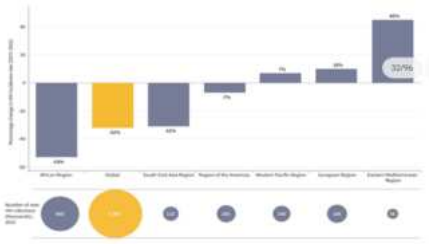

Figure -8 Percentage change in the number of new HIV infections per 1000 uninfected population,2015–2022, and number of new HIV infections, 2022, globally and by WHO region

Source: Joint United Nations Programme on HIV/AIDS

Solutions:

Addressing **AIDS (Acquired Immunodeficiency Syndrome)** as a global medical issue requires a **comprehensive strategy** involving prevention, treatment, healthcare access, and global cooperation. Here are key solutions:

Expanding HIV Prevention Programs

Increase condom distribution & education to promote safe sex practices.
- **Promote Pre-Exposure Prophylaxis (PrEP)**, a daily pill that reduces HIV risk by over **90%**.
- **Encourage harm reduction strategies** like needle exchange programs to prevent transmission among drug users.
- **Expand voluntary male circumcision** in high-prevalence areas, reducing transmission risk.

- **Improving HIV Testing & Early Diagnosis**

Increase free & accessible HIV testing, especially in high-risk populations.

- **Use rapid diagnostic tests** for same-day results and faster treatment initiation.
- **Reduce stigma around testing** through public awareness campaigns.

- **Ensuring Universal Access to Antiretroviral Therapy (ART)**

Scale up ART programs to ensure all diagnosed individuals receive life-saving treatment.

- **Lower the cost of ART drugs** through government subsidies and global partnerships.
- **Improve adherence support** with community-based programs and mobile health services.

- **Strengthening Healthcare Systems**

Train more healthcare workers specializing in HIV/AIDS care.

- **Improve healthcare infrastructure** in low-income countries to handle HIV/AIDS care efficiently.
- **Expand maternal healthcare programs** to prevent mother-to-child transmission.

- **5. Investing in HIV/AIDS Research & Vaccines**

Support HIV vaccine development to provide long-term immunity solutions.

- **Develop long-acting injectable treatments** to reduce daily pill burden.
- **Expand research on HIV cure strategies**, including gene therapy and immune-based treatments.

- **Fighting Stigma & Discrimination**

Promote anti-discrimination laws to protect people living with HIV/AIDS.

- **Increase education on HIV transmission** to reduce social stigma.
- **Empower affected communities** through advocacy programs and peer support networks.

- **Strengthening Global Cooperation**

Expand funding through programs like PEPFAR & The Global Fund to support low-income countries.

- **Encourage collaboration between governments, NGOs, and pharmaceutical companies** to improve access to medications.

- **Ensure WHO & UNAIDS leadership in coordinating global HIV/AIDS response efforts.**
- By implementing these solutions, the world can move closer to ending the HIV/AIDS epidemic.

3.1.2 Tuberculosis

Impacts of TB as global issue

Tuberculosis (TB) remains a major global health issue, significantly impacting medicine and public health. Its effects include:

High Morbidity and Mortality

TB is one of the leading infectious disease killers worldwide, with **over 10 million cases and 1.5 million deaths annually**.

- It primarily affects the lungs (pulmonary TB) but can also infect other organs (extrapulmonary TB).
- **Drug Resistance and Treatment Challenges**

The emergence of **multidrug-resistant TB (MDR-TB) and extensively drug-resistant TB (XDR-TB)** makes treatment more complex and expensive.

- Treatment for drug-resistant TB can take **up to two years** with severe side effects.

- **Burden on Healthcare Systems**

TB requires **long-term treatment and monitoring**, placing a heavy burden on healthcare facilities, especially in low-income countries.

- Delayed diagnosis and inadequate treatment increase transmission rates.

- **HIV and TB Co-Infection**

TB is the **leading cause of death among people with HIV/AIDS** due to weakened immunity.

Health Statistics Of TB

A leading infectious cause of death, TB disproportionately affects low-income populations, with drug-resistant strains becoming a growing problem.

An estimated 10.6 million (UI: 9.9–11.4 million) people developed TB globally in 2022, of which 55% were men, 33% were women and 12% were children under 15 years of age. The global TB incidence rate (SDG indicator 3.3.2) was 133 (UI: 124–143) per 100 000 population in 2022, down from 180 (UI: 134–233) per 100 000 population in 2000 and 146 (UI: 133–160) per 100 000 population in 2015.(Figure 9) shows that TB incidence rates varied enormously across countries and areas in 2022 .

The WHO End TB strategy calls for a 50% reduction of TB incidence rate by 2025 relative to the 2015 baseline, as a milestone towards the SDG 2030 and End TB 2035 targets .While TB incidence rate had continuously declined for many years up to 2020, two consecutive years of global increases in TB incidence (in 2021 and 2022) led to the TB incidence rate in 2022 reverting to the level of 2019. Globally, the net relative reduction in the TB incidence rate from 2015 to 2022 was 8.7%, falling far behind the WHO End TB strategy milestone.Nevertheless, there were encouraging signs of progress. The global trends in the number of people diagnosed with TB and treated showed a major recovery in 2022, after a sharp drop in 2020 due to the disruptions related to the COVID-19 pandemic

Figure-9 TB incidence rate by country and area, 2022

Source: WHO

Solution:

Tuberculosis (TB) remains a major global health issue, affecting millions of people every year. Addressing TB requires a multifaceted approach involving medical, social, and policy interventions. Here are some key solutions:

Strengthening TB Diagnosis and Treatment

Early Detection: Invest in rapid diagnostic tests like GeneXpert and AI-assisted imaging to detect TB early.

- **Shorter, More Effective Treatments:** Support the development of shorter and more effective drug regimens, such as the six-month BPaL regimen for drug-resistant TB.
- **Drug Resistance Management:** Ensure access to second-line TB drugs for multidrug-resistant (MDR-TB) and extensively drug-resistant (XDR-TB) cases.
- **Improved Adherence:** Utilize digital health tools (e.g., mobile apps, SMS reminders) and community health workers to ensure patients complete their treatment.

- **TB Prevention Strategies**

BCG Vaccination: Expand coverage of the Bacillus Calmette-Guérin (BCG) vaccine, especially in high-burden areas.

- **New Vaccine Development:** Invest in research for more effective TB vaccines, such as the M72/AS01E candidate.
- **Preventive Therapy:** Provide latent TB infection (LTBI) treatment to high-risk populations, including people living with HIV and close contacts of TB patients.
- **Improved Living Conditions:** Address social determinants by improving housing, reducing overcrowding, and enhancing nutrition.

- **Strengthening Health Systems**

Universal Healthcare Access: Ensure affordable TB care, especially in low-income and high-burden countries.

- **Integration with Other Health Programs:** Link TB services with HIV/AIDS, diabetes, and malnutrition programs to provide holistic care.
- **Health Workforce Training:** Train healthcare workers to enhance TB detection, treatment, and community engagement.

- **Research And Innovation**

New Drug Development: Encourage research on novel antibiotics and shorter treatment regimens.

- **Point-of-Care Diagnostics:** Develop affordable, easy-to-use diagnostic tools for remote and underserved areas.
- **Artificial Intelligence & Big Data:** Use AI for TB detection in X-rays and analyze big data for outbreak prediction.

- **Global Policy and Funding**

Increased Funding: Strengthen global financing from organizations like the WHO, Global Fund, and national governments.

- **Cross-Border TB Control:** Improve international cooperation to tackle TB in migrants and refugees.
- **Public Awareness Campaigns:** Educate communities about TB symptoms, prevention, and the importance of treatment adherence.

Eliminating TB requires a coordinated effort from governments, researchers, healthcare workers, and communities. With early detection, effective treatment, vaccine development, and strong public health policies, TB can be controlled and ultimately eradicated.

3.1.4 Malaria

Impacts Of Malaria As Global Issue

Malaria remains a major global health issue, significantly affecting medicine and public health. Its impacts include:

High Morbidity and Mortality

Malaria causes over **200 million infections** annually, leading to **hundreds of thousands of deaths**, primarily among children under five in sub-Saharan Africa.

- Severe malaria can lead to complications like **cerebral malaria, organ failure, and anemia**.

- **Economic and Healthcare Burden**

It strains healthcare systems in endemic regions, requiring significant **resources for treatment, prevention, and control**.

- Malaria reduces workforce productivity, affecting economies, especially in low-income countries.

Antimicrobial Resistance

The **emergence of drug-resistant Plasmodium falciparum strains** threatens current treatments like **artemisinin-based combination therapies (ACTs)**.

- Resistance to insecticides used in mosquito control (e.g., bed nets, sprays) complicates prevention efforts.

Challenges in Vaccine Development

- The complex life cycle of Plasmodium parasites has made vaccine development difficult.
- The **RTS,S (Mosquirix) and R21 vaccines** mark progress, but their effectiveness is **moderate** compared to vaccines for other infectious diseases.

- **Climate Change and Global Spread**

Rising temperatures and changing rainfall patterns expand **mosquito breeding grounds**, increasing malaria risk in previously unaffected areas.

- **Co-Infections and Comorbidities**

Malaria worsens outcomes for patients with **HIV/AIDS, tuberculosis, and malnutrition**, making treatment more complex.

- **Global Health Initiatives**

Organizations like the **WHO, Global Fund, and Roll Back Malaria Partnership** work to eliminate malaria through funding, research, and prevention strategies.

Malaria remains a significant challenge for global medicine, requiring continued innovation in treatment, vaccines, and prevention strategies to achieve eradication.

Health Statistics Of Malaria

In 2022, there were an estimated 249 million (UI: 225–278 million) malaria cases in 85 endemic countries and areas, leading to an estimated 631 000 (UI: 587 000–747 000) deaths .The Global technical strategy for malaria 2016–2030 (GTS) calls for a reduction in malaria case incidence by at least 40% by 2020, 75% by 2025 and 90% by 2030 from a 2015 baseline, among other milestones and targets . The global malaria incidence rate (malaria cases per 1000 population at risk, SDG indicator 3.3.3) was 59.8 (UI: 54.8–65.7) in 2015, having declined by 26% from 81.0 (UI: 75.7–87.7) in 2000. The incidence rate continued to fall until 2019, before rising by 3% in 2020 and remaining stable since. In 2022, the incidence rate was 58.4 (UI: 52.9–65.3); the expected rate was 26.2 if it was on trajectory to reach GTS targets. If the current trends continue, it is unlikely that the GTS incidence targets will be achieved) (8).The WHO African Region continues to bear the heaviest burden of malaria. In 2022, the region accounted for 94% of global malaria cases and 95% of global malaria deaths. Children under the age of five are particularly vulnerable; in 2022, almost four in every five malaria deaths in the region were among these young children WHO recently added the programmatic use of malaria vaccines for children living in endemic areas to the malaria prevention toolbox. The first malaria vaccine, RTS,S/AS01 (RTS,S), was recommended by WHO in 2021 after successful pilot programmes in Ghana, Kenya and Malawi through the Malaria Vaccine Implementation Programme . In 2023, WHO recommended a second safe and effective malaria vaccine, R21-Matrix-M (R21) . Wide implementation of malaria vaccines is expected to save tens of thousands of lives each year.

Solution:

Malaria remains a major global health challenge, but several solutions are being implemented to reduce its impact and work toward eradication.

Prevention Strategies

Insecticide-Treated Bed Nets (ITNs): Widespread use of ITNs reduces mosquito bites and malaria transmission.

- **Indoor Residual Spraying (IRS):** Applying insecticides inside homes kills mosquitoes before they can spread malaria.
- **Environmental Management:** Draining stagnant water and controlling mosquito breeding sites can reduce malaria transmission.

Vaccination Efforts

RTS,S (Mosquirix) and R21 Vaccines: These malaria vaccines provide partial protection, especially for children in high-risk

areas.

- **Ongoing Research:** Scientists are developing more effective malaria vaccines for long-term immunity.

Effective Treatment and Drug Development

Artemisinin-Based Combination Therapies (ACTs): The primary treatment for malaria, but efforts are needed to prevent drug resistance.

- **Drug Resistance Monitoring:** Surveillance programs track drug-resistant malaria strains to adjust treatments accordingly.
- **New Antimalarial Drugs:** Research is ongoing to develop alternative drugs to overcome resistance.

Strengthening Healthcare Systems

- **Early Diagnosis and Rapid Treatment:** Expanding access to rapid diagnostic tests (RDTs) ensures timely treatment.
- **Improving Healthcare Access:** Strengthening healthcare facilities, especially in rural areas, ensures better malaria

3.2 Non Communicable Diseases And Life Style Modifications

Impacts of non communicable diseases as global issue NCDs, such as heart disease, cancer, diabetes, and chronic respiratory diseases, are now the leading causes of death worldwide.

Non-communicable diseases (NCDs) are a major global health issue, significantly impacting medicine, healthcare systems, and economies. Here are some key impacts:

Health Burden

NCDs, such as heart disease, diabetes, cancer, and chronic respiratory diseases, are the leading causes of death worldwide, responsible for over 70% of global deaths.

- They contribute to long-term disability, reducing the quality of life for millions.
- Mental health disorders, often linked to NCDs, add to the global disease burden.

Economic Strain

NCDs lead to high healthcare costs due to prolonged treatment, medication, and hospital stays.

- Loss of workforce productivity due to illness and disability affects economic growth, especially in low- and middle-income countries.
- Families experience financial hardship from long-term medical expenses and caregiving responsibilities.

Healthcare System Challenges

NCDs require long-term management, putting pressure on healthcare systems.

- Many healthcare systems are designed to handle acute diseases rather than chronic conditions.
- A shortage of healthcare professionals trained in managing chronic diseases exacerbates the problem.

Inequality in Healthcare Access

Low-income populations are disproportionately affected due to limited access to preventive care and treatment.

- Many developing countries lack the infrastructure for early diagnosis and effective NCD management.
- The rising cost of medications and treatments makes NCD management unaffordable for many.

Impact on Global Health Policies

Governments and global organizations, such as the WHO, are prioritizing NCD prevention through policies on tobacco control, healthy diets, and physical activity promotion.

- There is a shift towards universal health coverage and integrated care models to manage NCDs more effectively.
- Research and innovation are focusing on personalized medicine and digital health solutions for NCD management.

Environmental and Lifestyle Factors

Urbanization, pollution, and unhealthy lifestyles (poor diet, physical inactivity, smoking, and alcohol consumption) contribute to rising NCD rates.

- Climate change exacerbates conditions like respiratory diseases and cardiovascular disorders.

NCDs are a critical challenge in global medicine, requiring urgent action in prevention, healthcare system reform, and policy changes. Addressing them effectively will reduce mortality, improve quality of life, and enhance global economic stability.

Health statistics of non communicable diseases as global issue in medicine Although the burden of communicable diseases—especially HIV Infection, TB, and malaria—still accounts for the majority of deaths in resource-poor regions such as sub-Saharan Africa, 63% of all deaths worldwide in 2008 were held to be due to NCDs. Although we will use this term to describe cardiovascular diseases, cancers, diabetes, and chronic lung diseases, this usage masks important distinctions. For instance, two significant NCDs in low-income countries, rheumatic heart disease (RHD) and cervical cancer, represent the chronic sequelae of infections with group A Streptococcus and human papillomavirus, respectively. It is in these countries that the burden of disease due to NCDs is rising most rapidly. Close to 80% of deaths attributable to NCDs occur in low- and middle-income countries, where 86% of the global population lives. The WHO reports that ~25% of global NCD-related deaths take place before the age of 60—a figure representing ~5.7 million people and exceeding the total number of deaths due to AIDS, TB, and malaria combined. In almost all high-income countries, the WHO reported that NCD deaths accounted for ~70% of total deaths in 2008. By 2020, NCDs will account for 80% of the global burden of disease and for 7 of every 10 deaths in developing countries. The recent increase in resources for and attention to communicable diseases is both welcome and long overdue, but developing countries are already carrying a "double burden" of communicable and noncom-municable diseases.

Diabetes, Cardiovascular Disease, and Cancer: A Global Perspective In contrast to TB, HIV infection, and malaria—diseases caused by single pathogens that damage multiple organs—cardiovascular diseases reflect injury to a single organ system downstream of a variety of insults, both infectious and noninfectious. Some of these insults result from rapid changes in diet and labor conditions. Other insults are of a less recent vintage. The burden of cardiovas-cular disease in low-income countries represents one consequence of decades of neglect of health systems. Furthermore, cardiovascular research and investment have long focused on the ischemic conditions that are increasingly common in high- and middle-income countries. Meanwhile, despite awareness of its health impact in the early twentieth century, cardiovascular damage in response to infection and malnutrition has fallen out of view until recently.The misperception of cardiovascular diseases as a problem primarily of elderly populations in middle- and high income countries has con-tributed to the neglect of these diseases by global health institutions. Even in Eastern Europe and Central Asia, where the collapse of the Soviet Union was followed by a catastrophic surge in cardiovascular disease deaths (mortality rates from ischemic heart disease nearly doubled between 1991 and 1994 in Russia, for example), the modest flow of overseas development assistance to the health sector focused on the communicable causes that accounted for < 1 in 20 excess deaths during that period.

Diabetes The International Diabetes Federation reports that the number of diabetic patients in the world is expected to increase from 366 million in 2011 to 552 million by 2030. Already, a significant proportion of diabetic patients live in developing countries where, because those affected are far more frequently between ages 40 and 59, the complications of micro- and macrovascular disease take a far greater toll. Globally, these complications are a major cause of disability and reduced quality of life. A high fasting plasma glucose level alone ranks seventh among risks for disability and is the sixth leading risk factor for global mortality. The GBD 2010 estimates that diabetes accounted for 1.28 million deaths in 2010, with almost 80% of those deaths occurring in low- and middle-income countries.

Predictions of an imminent rise in the share of deaths and disabilities due to NCDs in developing countries have led to calls for preventive policies to improve diet, increase exercise, and restrict tobacco use, along with the prescription of multidrug regimens for persons at highlevel vascular risk. Although this agenda could do much to prevent pandemic NCD, it will do little to help persons with established heart disease stemming from nonatherogenic pathologies.

Cardiovascular disease Because systemic investigation of the causes of stroke and heart failure in sub-Saharan Africa has begun only recently, little is known about the impact of elevated blood pressure in this portion of the continent. Modestly elevated blood pressure in the absence of tobacco use in populations with low rates of obesity may confer little risk of adverse events in the short run. In contrast, persistently elevated blood pressure above 180/110 goes largely undetected, untreated, and uncontrolled in this part of the world. In the cohort of men assessed in the Framingham Heart Study, the prevalence of blood pressures above 210/120—severe hypertension—declined from 1.8% in the 1950s to 0.1% by the 1960s with the introduction of effective antihypertensive agents. Although debate continues about appropriate screening strategies and treatment thresholds, rural health centers staffed largely by nurses must quickly gain access to essential antihypertensive medications.

The epidemiology of heart failure reflects inequalities in risk factor prevalence and in treatment. The reported burden of this condition has remained unchanged since the 1950s, but the causes of heart failure and the age of the people affected vary across the globe. Heart failure as a consequence of pericardial, myocardial, endocardial, or valvular injury accounts for as many as 5% of all medical admissions to hospitals around the world. In high-income countries, coronary artery disease and hypertension among the elderly account for most cases of heart failure. For example, in the United States, coronary artery disease is present in 60% of patients with heart failure and hypertension in 70%. Among the world's poorest 1 billion people, however, heart failure reflects poverty-driven exposure of children and young adults to rheumatogenic strains of streptococci and cardiotropic microorganisms (e.g., HIV, Trypanosoma cruzi, enteroviruses, M. tuberculosis), untreated high blood pressure, and nutrient deficiencies. The mechanisms underlying other causes of heart failure common in these populations—such as idiopathic dilated cardiomyopathy, peripartum cardiomyopathy, and endomyocardial fibrosis—remain unclear.In stark contrast to the extraordinary lengths to which clinicians in wealthy countries will go to treat ischemic cardiomyopathy, little attention has been paid to young patients with nonischemic cardiomyopathies in resource-poor settings. Nonischemic cardiomyopathies, such as those due to hypertension, RHD, and chronic lung disease, account for >90% of cases of cardiac failure in sub-Saharan Africa and include poorly understood entities such as peripartum cardiomyopathy (which has an incidence in rural Haiti of 1 per 300 live births) and HIV-associated cardiomyopathy. Multidrug regimens that include beta blockers, angiotensin-converting enzyme inhibitors, and other agents can dramatically reduce mortality risk and improve quality of life for these patients. Lessons learned in the scale-up of chronic carefor HIV infection and TB may be illustrative as progress is made in establishing the means to deliver heart-failure therapies.Some from the chronic infections discussed above are, of course, relevant to cardiovascular disease, especially those classified as NCDs but caused by infectious pathogens. Integration of prevention and care remains as important today as in 1960 when Paul Dudley White and his colleagues found little evidence of myocardial infarction in the region near the Albert Schweitzer Hospital in Lambaréné, Gabon, but reported that "the high prevalence of mitral stenosis is astonishing…. We believe strongly that it is a duty to help bring to these sufferers the benefits of better penicillin prophylaxis and of cardiac surgery when indicated.

The same responsibility exists for those with correctable congenital cardiovascular defects."RHD affects more than 15 million people worldwide, with more than 470,000 new cases each year. Among the 2.4 million annual cases of pediatric RHD, an estimated 42% occur in sub-Saharan Africa. This disease, which may cause endocarditis or stroke, leads to more than 345,000 deaths per year—almost all occurring in developing countries. Researchers in Ethiopia have reported annual death rates as high as 12.5% in rural areas. In part because the prevention of RHD has not advanced since the disease's disappearance in wealthy countries, no part of sub-Saharan Africa has eradicated RHD despite examples of success in Costa Rica, Cuba, and some Caribbean nations. A survey of acute heart failure among adults in sub-Saharan Africa showed that ~14.3% of these cases were due to RHD. Strategies to eliminate rheumatic heart disease may depend on active case-finding, with confirmation by echocardiography, among high-risk groups as well as on efforts to expand access to surgical interventions among children with advanced valvular damage. Partnerships between established surgical programs and areas with limited or nonexistent facilities may help expand the capacity to provide life-saving interventions to patients who otherwise would die early and painfully. A long-term goal is the establishment of regional centers of excellence equipped to provide consistent, accessible, high-quality services.

Clinicians from tertiary care centers in sub-Saharan Africa and else-where have continued to call for prevention and treatment of the cardiovascular conditions of the poor. The reconstruction of health services in response to pandemic infectious disease offers an opportunity to identify and treat patients with organ damage and to undertake the prevention of cardiovascular and other chronic conditions of poverty.

Cancer Cancers account for ~5% of the global burden of disease. Lowand middle-income countries accounted for more than two-thirds of the 12.6 million cases and 7.6 million deaths due to cancer in 2008. By 2030, annual mortality from cancer will increase by 4 million—with developing countries experiencing a sharper increase than developed nations. "Western" lifestyle changes will be responsible for the increased incidence of cancers of the breast, colon, and prostate among populations in low- and middle-income countries, but historic realities, sociocultural and behavioral factors, genetics, and poverty itself also will have a profound impact on cancer-related mortality and morbidity rates. At least 2 million cancer cases per year—18% of the global cancer burden—are attributable to infectious causes, which are responsible for <10% of cancers in developed countries but account for up to 20% of all malignancies in low- and middle-income countries. Infectious causes of cancer such as human papillomavirus, hepatitis B virus, and Helicobacter pylori will continue to have a much larger impact in developing countries. Environmental and dietary factors, such as

indoor air pollution and high-salt diets, also contribute to increased rates of cer-tain cancers (e.g., lung and gastric cancers). Tobacco use (both smoking and chewing) is the most important source of increased mortality rates from lung and oral cancers. In contrast to decreasing tobacco use in many developed countries, the number of smokers is growing in developing countries, especially among women and young persons.For many reasons, outcomes of malignancies are far worse in developing countries than in developed nations. As currently funded, overstretched health systems in poor countries are not capable of early detection; the majority of patients already have incurable malignancies at diagnosis. Treatment of cancers is available for only a very small number of mostly wealthy citizens in the majority of poor countries, and, even when treatment is available, the range and quality of services are often substandard. Yet this need not be the future. Only a decade ago, MDR-TB and HIV infection were considered untreatable in settings of great poverty. The feasibility of creating innovative programs that reduce technical and financial barriers to the provision of care for treatable malignancies among the world's poorest populations is now clear . Several middle-income countries, including Mexico, have expanded publicly funded cancer care to reach poorer populations. This commitment of resources has dramatically improved outcomes for cancers, from childhood leukemia to cervical cancer.

Mortality Due To NCDs

Improved prevention, diagnosis and treatments has led to steady decline in premature mortality from NCDs. Globally, a person aged 30 years in 2000 had a 22.7% (UI: 18.7–27.2%) chance of dying from one of the four major NCDs (cardiovascular disease, cancer, chronic respiratory disease and diabetes) before the age of 70 years (SDG indicator 3.4.1). This risk fell to 18.2% (UI: 14.2–23.0%) in 2019 before the onset of the pandemic, corresponding to an approximately 20% reduction .

Regional disparity exists in both the levels and pace of progress. The Eastern Mediterranean Region started with the highest risk of premature mortality (27.2% [UI: 19.4–36.4%]) in 2000 and, notwithstanding a 15.4% reduction, the risk in 2019 (23.0% [UI: 15.9–31.5%]) remained high compared with other regions except for the South-East Asia Region, where the progress stagnated in 2000–2019. In contrast, the Region of the Americas had the lowest risk of NCD premature mortality (18.2% [UI: 16.6–19.9%]) in 2000 among all regions and stayed at the lowest level (13.9% [UI: 12.3–15.7%]) in 2019, with a 23.8% reduction between 2000 and 2019. The other three regions started at similar levels (22.2–23.9%) in 2000; however, the African Region saw more moderate decline (10.9%) and reached a premature mortality risk of 21.3% (UI: 13.5–31.3%) in 2019, whereas the fastest declines among all regions were observed in the European and Western Pacific regions (32.0% and 28.0% decline, respectively) (Fig. 10)

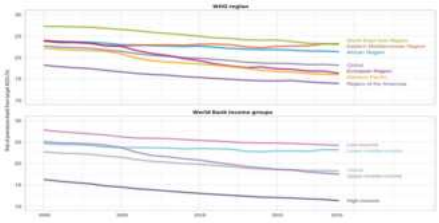

Figure -10 Trends in the probability of dying between ages 30 and 69 years from one of the four major NCDs, globally, by WHO region and by World Bank income group, 2000–2019 Source -WHO

Despite the progress made, the pace of change in most countries has slowed since the beginning of the SDG era in 2015. With the global ARR slowing significantly (more than halved compared with the first 15 years of the century) between 2015 and 2019 to under 1%, the world is not on track to reach the 2030 SDG target. The only region where some acceleration was seen was the Eastern Mediterranean Region, yet the accelerated ARR was still less than half of that required to meet the SDG target. The region of most concern in meeting the target is South-East Asia Region, where the previous overall slow but still declining trend in 2000–2015 has reversed, with an increase in premature NCD mortality in 2015–2019. The other regions all underwent major declines in ARR, ranging from a 8% reduction in the African Region to over a third reduction in the Western Pacific Region .

About 60 countries with good vital registration data that are available for 2020 and/or 2021 present a mixed picture of NCD premature mortality during the pandemic. Some countries saw further slowdown of reduction or even increasing NCD mortality during the pandemic as a result of disruptions to NCD services, while other countries observed accelerated decline in NCD premature mortality. The latter may well be an artefact, as patients with NCDs are also at greater danger of dying prematurely from COVID-19 as a competing risk (and so recorded as COVID-19 deaths). There are still many unknowns around the progress in NCD premature mortality during the COVID-19 pandemic that can only be answered with more and better cause of death data to document the trends during and after the pandemic.

Solution For Non Communicable As Global Issue In Medicine

Addressing non-communicable diseases (NCDs) as a global issue in medicine requires a multi-faceted approach involving prevention, healthcare system strengthening, policy changes, and technological advancements. Here are key solutions:

Prevention and Lifestyle Modifications

Healthy Diet Promotion: Encouraging consumption of fruits, vegetables, and whole grains while reducing processed foods, sugar, and unhealthy fats.

- **Physical Activity**: Governments and organizations should promote exercise programs, build walking/biking infrastructure, and encourage active lifestyles.
- **Tobacco and Alcohol Control**: Implementing higher taxes, bans on advertising, and awareness campaigns to reduce tobacco and alcohol consumption.
- **Mental Health Awareness**: Addressing stress, anxiety, and depression through better access to counseling and stress management programs.

Strengthening Healthcare Systems

- **Universal Health Coverage**: Ensuring all people have access to affordable diagnosis, treatment, and management of NCDs.
- **Training Healthcare Workers**: Expanding training programs for doctors, nurses, and community health workers to manage chronic diseases effectively.
- **Early Diagnosis and Screening**: Implementing regular screenings for high-risk populations to detect conditions like diabetes, hypertension, and cancer early.
- **Affordable Medications**: Governments should negotiate with pharmaceutical companies to lower the cost of essential medicines.

- **Policy And Government**

Interventions

- **Regulation of Food and Beverage Industry**: Enforcing labeling laws, banning trans fats, and reducing sugar content in processed foods.
- **Air Pollution Control**: Implementing policies to reduce emissions, promote clean energy, and improve urban planning for healthier living environments.
- **Public Health Campaigns**: Running awareness programs on television, social media, and in schools to educate

people about NCD risks.

Technological and Medical Innovations

- **Telemedicine and Digital Health**: Expanding remote monitoring and consultations to improve access to NCD management, especially in rural areas.
- **Wearable Health Devices**: Encouraging the use of smartwatches and apps that track physical activity, heart rate, and blood sugar levels.
- **AI and Big Data in Healthcare**: Using artificial intelligence to predict NCD risks, personalize treatment, and optimize healthcare delivery.

Global Collaboration

- **International Partnerships**: Governments, WHO, and NGOs must work together to share research, funding, and best practices for NCD control.
- **Investment in Research**: More funding should go into developing innovative treatments, vaccines (e.g., for cancer), and lifestyle-based interventions.

The fight against NCDs requires a global commitment to prevention, improved healthcare systems, and policy changes. By integrating lifestyle modifications, government policies, medical advancements, and international cooperation, we can reduce the burden of NCDs and improve global health outcomes.

3.3 Anti Microbial Resistance

The overuse and misuse of antibiotics have led to drug-resistant bacteria, making infections harder to treat. AMR could lead to a global crisis where common infections become deadly again.

Impacts of AMR as global issue

Impacts of Antimicrobial Resistance (AMR) as a Global Issue in Medicine

Antimicrobial resistance (AMR) is a serious global health crisis that threatens modern medicine, public health, and economic stability. Here are its key impacts:

Increased Mortality and Morbidity

- AMR causes infections that are harder to treat, leading to prolonged illness and higher death rates.
- Common infections like pneumonia, tuberculosis, and urinary tract infections become life-threatening.
- The WHO estimates that AMR could cause **10 million deaths per year by 2050** if no action is taken.

Healthcare System Overload

- Patients with drug-resistant infections require **longer hospital stays, more intensive care, and expensive treatments.**
- Higher demand for isolation wards and specialized care strains healthcare resources.
- Routine procedures like surgeries, cancer treatments, and organ transplants become riskier due to untreatable infections.

Economic Burden

- AMR increases healthcare costs due to prolonged treatments, expensive second-line drugs, and extended hospital stays.
- Productivity losses occur as people remain sick for longer or die prematurely.
- Global economic losses from AMR could reach **$100 trillion by 2050**, affecting businesses and national economies.

Threat To Modern Medicine

- Many life-saving treatments, including chemotherapy and complex surgeries, rely on effective antibiotics to prevent infections.
- Without effective antimicrobials, these procedures could become too risky to perform.
- The rise of **superbugs** (highly resistant bacteria) could push healthcare back to the pre-antibiotic era.

Impact on Public Health and Epidemics

- AMR can lead to **untreatable outbreaks of infectious diseases** like tuberculosis and gonorrhea.
- Drug-resistant infections spread easily within hospitals and communities, increasing global health risks.
- Developing countries, with weaker healthcare systems and sanitation, are hit the hardest.

Limited Development of New Antibiotics

- Pharmaceutical companies invest less in developing new antibiotics due to **high costs and low profitability**.
- Fewer new antibiotics are reaching the market, leading to a growing gap in effective treatments.
- Without innovation, **existing antibiotics will continue to lose effectiveness** against resistant bacteria.

Agricultural and Environmental Impact

- Overuse of antibiotics in **livestock and agriculture** contributes to resistance, as drug-resistant bacteria spread from animals to humans.
- Contaminated water sources carry resistant bacteria, increasing the risk of AMR in communities.

AMR is a **global medical crisis** that threatens healthcare, economies, and public health. Urgent action is needed, including antibiotic stewardship, investment in new treatments, and global cooperation, to prevent a future where common infections become deadly again.

Health statistics of AMR

AMR affects countries in all regions and at all income levels. It is a complex problem that requires both sectorspecific actions in the human health, food production, animal and environmental sectors, and a coordinated approach across these sectors. In 2015, the World Health Assembly adopted the Global Action Plan on AMR, committing, among other things, to the development and implementation of multisectoral national action plans . As of November 2023, some 178 countries had such plans developed. However, in 2023 only 27% of countries reported implementing their national action plans effectively and only 11% had allocated national budgets to do so.

SDG indicator 3.d.2 is defined as the percentage of bloodstream infections due to selected antimicrobial-resistant organisms. Median resistance to third-generation cephalosporins in Escherichia coli (E. coli) and methicillin resistance in Staphylococcus aureus (S. aureus)were 41% and 32% in 2021, respectively, compared with 26.9% and 13.4% in 2016. However, no conclusions can be made on whether changes in resistance have occurred over time. The reasons for this are twofold: first, the pool of reporting countries has changed significantly over the years. In 2016, only 16 countries contributed data on resistance to third-generation cephalosporins in E. coli, compared with 77 in 2021. Similarly, only 15 countries provided data in 2016 on methicillin resistance in S. aureus in 2016, compared with 78 in 2021. Second, the number of resource-limited settings providing data has increased in recent years. Testing coverage in these settings is often low, with data often limited to tertiary referral, private hospitals and/or research facilities, and biased towards complex infections and treatment failures. Higher median resistance in recent years is at least in part consistent with potential biases resulting from the convenience sampling of health facilities for reporting AMR data in many settings. Priorities to address AMR include surveillance of antimicrobial consumption. The Global

Antimicrobial Resistance and Use Surveillance System (GLASS) provides a common and standardized set of methods for measuring and reporting. Of the 57 countries with data (2018–2021), 36 (63%) achieved the target of at least 60% of total antibiotic consumption being "Access" group antibiotics . The overall goal is to reduce the use of "Watch and reserve" group antibiotics and to increase the relative benefit and the availability of Access group antibiotics, where needed.Health-related SDGs solution for AMR as global issue

Addressing AMR requires a coordinated global effort, including government policies, healthcare reforms, research investments, and public awareness campaigns. Here are key solutions:

Rational Use of Antibiotics

Antibiotic Stewardship Programs (ASP): Hospitals and clinics must regulate antibiotic prescriptions to ensure they are only used when necessary.

Guidelines for Prescriptions: Doctors should follow evidence-based guidelines to prevent overprescription and misuse of antibiotics.

Public Awareness Campaigns: Educating people on the dangers of self-medication and the importance of completing prescribed antibiotic courses.

Strengthening Healthcare Systems

- **Improved Infection Control:** Hospitals should implement strict hygiene practices, including handwashing, sterilization, and isolation of resistant cases.
- **Better Diagnostics:** Rapid diagnostic tools can help identify infections quickly and reduce unnecessary antibiotic use.
- **Surveillance And Reporting:** Governments and health organizations must track AMR cases to respond effectively to outbreaks.

Development Of New Antibiotics And Treatments

- **Investment in Research & Development:** Governments and private companies should fund the discovery of new antibiotics and alternative treatments.
- **Incentives for Pharma Companies:** Encouraging pharmaceutical firms to develop new drugs by offering grants, tax breaks, and financial incentives.
- **Exploring Alternative Therapies:** Research into bacteriophage therapy, probiotics, and immunotherapies as possible alternatives to traditional antibiotics.

Regulation of Antibiotics in Agriculture

- **Banning Unnecessary Antibiotic Use:** Antibiotics should not be used to promote animal growth; they should only be used for treating infections.
- **Promoting Sustainable Farming Practices:** Encouraging alternatives like probiotics, vaccines, and improved hygiene in livestock farming.
- **Monitoring Drug Use in Agriculture:** Governments should regulate and track antibiotic use in food production.

Global Collaboration And Policy Implementation

- **International Cooperation:** WHO, CDC, and other health organizations must work together to implement AMR action plans worldwide.
- **Strict Regulations on Antibiotic Sales:** Many countries should restrict over-the-counter sales of antibiotics to prevent misuse.
- **Surveillance Networks:** Strengthening global monitoring of AMR trends to respond effectively to new resistant strains.

Public Awareness And Education

- **Educational Campaigns:** Schools and communities should be educated on AMR risks and responsible antibiotic use.
- **Training Healthcare Professionals:** Doctors, nurses, and pharmacists should receive ongoing training on AMR prevention and treatment.
- **Community Engagement:** Encouraging people to practice good hygiene, vaccination, and responsible medication use to reduce infection risks.

Tackling AMR requires a **multi-sectoral approach**, including responsible antibiotic use, research on new treatments, improved healthcare policies, and public awareness. If left unaddressed, AMR could turn common infections into deadly diseases, threatening modern medicine and global health security.

3.4 Health Care Inequality And Acces To Medicine

Impact of health care inequality and access to medicine as global issue Healthcare inequality and limited access to medicine are major global challenges that significantly impact individuals and societies. These issues arise due to disparities in economic conditions, geographic location, political instability, and healthcare infrastructure. Below are some key impacts:

Increased Mortality And Morbidity

Lack of access to essential medicines and healthcare services leads to preventable deaths from diseases such as tuberculosis, malaria, and HIV/AIDS.

Non-communicable diseases like diabetes and hypertension remain unmanaged, leading to severe complications.

Widening Socioeconomic Disparities

- Poor health outcomes keep marginalized communities in a cycle of poverty, as they struggle with medical expenses and lost income due to illness.
- Wealthier populations have access to advanced treatments, while low-income groups face barriers to even basic care.

Global Health Security Risks

- Inadequate healthcare access in one region can lead to the uncontrolled spread of infectious diseases, as seen with COVID-19 and Ebola.
- Antimicrobial resistance (AMR) is exacerbated by limited access to proper medication and overuse of substandard treatments.

Economic Burden On Countries

- Developing nations with high disease burdens face increased healthcare costs, reducing resources for other critical sectors like education and infrastructure.
- Productivity losses due to untreated illnesses impact national economies, reducing workforce efficiency.

Ethical And Human Rights Concerns

- Healthcare is a fundamental human right, yet many populations are denied access to life-saving treatments.
- Pharmaceutical monopolies and high drug prices prevent equitable distribution of medicine.

Barriers To Medical Advancements

- Research and innovation in medicine often prioritize profit-driven markets, neglecting diseases that primarily affect low-income regions (e.g., neglected tropical diseases).
- Patent laws and trade policies restrict the availability of affordable generic medications.
- Solutions for health care inequality and access to medicine as global issue

- Addressing healthcare inequality and improving access to medicine requires a multifaceted approach involving governments, international organizations, healthcare providers, and the private sector. Below are key solutions:

Expanding Universal Health Coverage (UHC)

Governments should implement UHC policies to ensure that essential healthcare services, including medications, are accessible and affordable for all.

Funding should be allocated toward strengthening public healthcare systems, particularly in low-income regions.

Reducing Drug Costs and Promoting Generic Medicines

- Encourage the production and distribution of generic drugs to lower costs and increase accessibility.
- Reform patent laws to allow for more equitable drug pricing and prevent monopolization by pharmaceutical companies.
- Support initiatives like the Medicines Patent Pool (MPP) to improve access to affordable life-saving drugs.

Strengthening Global Health Partnerships

- Organizations such as the **World Health Organization (WHO), Gavi, and the Global Fund** should continue funding healthcare programs in underserved regions.
- Developed nations should increase aid for healthcare infrastructure and medicine distribution in low-income countries.

Improving Healthcare Infrastructure

- Investments in healthcare facilities, medical supply chains, and digital health technologies can ensure timely and efficient delivery of medicine.
- Training and hiring more healthcare workers, especially in rural and underserved areas, can improve service delivery.

Enhancing Research And Development For Neglected Diseases

- Governments and private sectors should allocate more funding toward research on diseases primarily affecting low-income populations, such as malaria and tuberculosis.
- Incentives like public-private partnerships (PPPs) can encourage pharmaceutical companies to develop treatments for neglected diseases.

Addressing Social Determinants Of Health

- Improving education, nutrition, sanitation, and economic opportunities can enhance overall health outcomes and reduce disease burdens.
- Community outreach programs can help raise awareness about disease prevention and the importance of seeking medical care.

Leveraging Technology For Healthcare Access

- Telemedicine and mobile health (mHealth) services can provide remote consultations and prescription services, helping those in hard-to-reach areas.
- AI and big data analytics can improve disease tracking and optimize the distribution of medical supplies.

Global Policy Reforms

- Governments should negotiate fair pricing for essential medicines and work to eliminate excessive tariffs on imported medications.
- Strengthening intellectual property (IP) flexibility in trade agreements can allow low-income countries to produce or import affordable medicines.

By implementing these solutions, healthcare systems can move toward a more equitable model, ensuring that essential medical care and life-saving medicines are accessible to all, regardless of income or geography.

3.5 Climate And Environmental Change

Environmental factors, including pollution and climate change, are increasingly affecting public health.

Human health is dependent on a variety of environmental factors, such as safe WASH, clean air, safe chemical use, healthy built environments, sound agricultural practices, and protected natural areas and water sources. This section outlines the global progress towards universal access to WASH and the reduction of air pollution

WASH

Between 2000 and 2022, worldwide some 2.1 billion people gained access to safely managed drinking water (687 million increase since 2015) and 2.5 billion people gained access to safely managed sanitation (902 million increase since 2015). Since 2015, the number of people with basic hygiene services has increased by over 1 billion. Access to safe WASH services improved significantly in rural areas between 2015 and 2022, but progress is limited in urban areas, when measured by the proportion of the population gaining services. However, because of population growth in urban areas, the number of people who have gained access to safely managed drinking water and sanitation services since 2015 is higher in urban than in rural areas (Fig. 11)

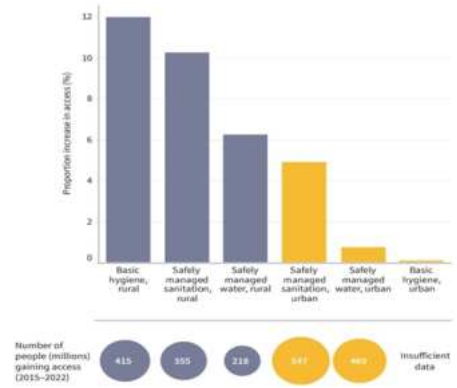

Figure-11 Percentage increase in the proportion of global population with access to WASH services, and the number of people who gained access, 2015–2022

Source:- unicef, WHO

The global coverage of safely managed drinking water (SDG indicator 6.1.1) increased from 69% in 2015 to 73% in 2022, rising from 56% to 62% in rural areas and from 80% to 81% in urban areas. The coverage also varied greatly across WHO regions: in 2022, while nine out of 10 (92%) people in the European Region had access to safely managed drinking-water, only one third (33%) of people in the African Region did. To achieve the SDG target of universal access by 2030, the overall rate of progress will need to increase sixfold.Since 2015, the global coverage of safely managed sanitation (SDG indicator 6.2.1) has increased from 49% to 57% in 2022, rising from 36% to 46% in rural areas and from 60% to 65% in urban areas. The African Region remained the WHO region with the lowest overall coverage, from 23% in 2015 to 26% in 2022. The SouthEast Asia and Western Pacific regions experienced the largest increases during the same period, reaching 49% and 68%, respectively, in 2022. To achieve universal access by 2030, the global rate of progress will need to increase fivefold.In 2022, the global coverage of basic hygiene services (SDG indicator 6.2.2) reached 75%, up from 67% in 2015. The coverage rose from 53% to 65% in rural areas, but remained stable at around 83% in urban areas. Overall coverage also remained largely unchanged in the African Region at 26%, as

the gain in rural areas was offset by the decline in coverage in urban areas from 40% in 2015 to 36% in 2022. To achieve universal access by 2030, the global rate of progress will need to increase threefold.The proportion of total, domestic and industrial wastewater flows that are safely treated is monitored by SDG indicator 6.3.1. Wastewater statistics, however, are at an early stage of development in many countries and there is a lack of reporting, especially from industrial sources. Among the 73 countries (representing 42% of the global population) reporting volumes of total wastewater generated and treated, 76% of total wastewater flows received some level of treatment in 2022. Among the 42 countries (representing 12% of the population) reporting the type of treatment received, 60% of total wastewater flows had at least secondary treatment. In a separate calculation based on data from 140 countries and areas (representing 92% of all household wastewater flows), an estimated 58% of household wastewater was safely treated in 2022.Many low- and middle-income countries lack domestic resources to improve the water sector. Between 2021 and 2022, official development assistance (ODA) disbursements to the water sector (SDG indicator 6.a.1) rose by 11% to US$ 9.1 billion, a rebound from the declining trend seen over the previous five years. ODA commitments also increased by 16% to US$ 11.4 billion. However, water sector ODA disbursements as a percentage of total ODA across all sectors decreased to 3.2% in 2022, a historical low, and continuing a downwards trend which has accelerated since the start of the COVID-19 pandemic in 2020.These trends show that while progress towards universal access to safe WASH has been made in some areas, there are still some gaps in data and service coverage. Sustained actions to promote equitable access to WASH services are necessary to tackle these challenges.

Air Pollution

The use of clean cooking fuels and technologies significantly reduces exposure to household air pollution, particularly among women and children who spend the most time near the domestic hearth. Globally, the proportion of population with primary reliance on clean fuels and technologies for cooking (SDG indicator 7.1.2) steadily improved from 49% in 2000 to 64% in 2015 and 74% in 2022. The access deficit therefore decreased from about half of the world's population in 2000, to a little over a third in 2015 and about a quarter in 2022. However, this means that 2.1 billion people were still relying on polluting fuels and technologies for cooking in 2022, and the target of universal access by 2030 will not be met if current trends continue. Moreover, rural populations continued to have lower access than urban populations. Particulate matter (PM) is a common proxy indicator for air pollution. In 2019, almost all (99%) of the world's population was exposed to unhealthy levels of fine PM. Globally, the annual average population-weighted concentration of fine PM in urban areas (SDG indicator 11.6.2) was 33 g/m3 (UI: 32–34 g/m3) in 2019, over six times the recommended level for protecting public health according to the WHO air quality guidelines (5 g/m3). However, it stood at around interim target 1 of the guidelines (35 g/m3), and the five-year average level of 2015–2019 (36 g/m3) was 9% lower than that of 2010–2014 (39 g/m3), signalling improvement in outdoor air quality globally. The Western Pacific Region saw the largest reduction (16%) in the levels of fine PM between the two periods. The Region of the Americas and the European Region continued to have the lowest levels of fine PM since 2010 while simultaneously improving air quality over the years, thanks to regional cooperation and legislations.Addressing air pollution contributes significantly to safeguarding public health, promoting SDGs and mitigating climate change impacts.

Solutions For Climate And Environmental Factors As A Global Issue In Medicine

Addressing the impact of climate change and environmental degradation on global health requires coordinated action from governments, healthcare systems, industries, and communities. Below are key solutions:

Strengthening Climate-Resilient Healthcare Systems Build and upgrade **climate-resilient hospitals** that can withstand extreme weather events (e.g., hurricanes, floods, and heatwaves).

Improve **early warning systems** for disease outbreaks linked to climate change, such as malaria, cholera, and respiratory illnesses.

Train healthcare professionals in **climate-related health risks** to improve preparedness and response.

Reducing Air Pollution For Better Respiratory Health

- Implement stricter **air quality regulations** to limit industrial emissions and vehicle pollution.
- Promote **clean energy sources** (solar, wind, and hydroelectric) to reduce reliance on fossil fuels.
- Encourage urban planning that **reduces traffic congestion** and promotes **public transportation, cycling, and green spaces**.

Combating Infectious Disease Spread

- Strengthen **vector control programs** (e.g., mosquito nets, insecticides, and vaccinations) to prevent malaria and dengue outbreaks.
- Improve **water sanitation infrastructure** to reduce waterborne diseases like cholera and typhoid.
- Expand **public health surveillance** to track and respond to emerging climate-related diseases.

Addressing Food And Water Security

- Invest in **climate-smart agriculture** (e.g., drought-resistant crops and sustainable farming techniques) to ensure stable food supplies.
- Enhance **water conservation efforts**, such as rainwater harvesting and desalination, to provide safe drinking water.
- Reduce food waste and support **sustainable food production** to mitigate malnutrition risks.

Reducing Antimicrobial Resistance (AMR)

- Regulate **waste disposal from pharmaceutical and agricultural industries** to prevent contamination of water sources with antibiotics.
- Promote **responsible antibiotic use** in healthcare and livestock farming to slow the spread of resistant bacteria.
- Support research into **alternative treatments**, such as vaccines and new antimicrobial drugs.

Addressing Mental Health Impacts of Climate Change

- Expand **mental health services** for communities affected by climate disasters, displacement, and eco-anxiety.
- Develop **support programs** for farmers and workers whose livelihoods are threatened by environmental changes.
- Increase **awareness and education** on coping strategies for climate-induced stress.

Global Policy and Governance Reforms

- Integrate **climate and health policies** in national healthcare planning and disaster preparedness.
- Strengthen **international agreements** (e.g., the Paris Agreement) to reduce global carbon emissions.
- Increase **funding for climate-health research** to better understand and combat climate-related diseases.

Promoting Sustainable Lifestyles And Community Action

- Encourage individuals to **reduce carbon footprints**

through energy-efficient choices, plant-based diets, and reduced waste.
- Support **reforestation and conservation efforts** to maintain natural ecosystems and reduce climate impacts.
- Strengthen **community-based health initiatives** to educate and empower local populations in climate resilience.

By implementing these solutions, we can reduce the impact of climate change on global health, improve healthcare resilience, and protect vulnerable populations from environmental hazards. Urgent action is needed to safeguard the future of public health.

4. The Role of Technology in Addressing Global Medical Issues

Medical technology has the potential to revolutionize healthcare and address many of the challenges discussed.

Key Innovations:

Telemedicine: Improves healthcare access, especially in remote areas.

Artificial Intelligence (AI): Enhances diagnostic accuracy and streamlines hospital operations.

mRNA Vaccines: Rapidly developed during the COVID-19 pandemic, mRNA technology holds promise for future vaccine advancements.

3D Printing: Enables the production of affordable prosthetics and customized medical devices.

- **Challenges in Implementing Technology:**
- Digital healthcare disparities in low-income regions.
- Ethical concerns regarding patient data privacy.
- High costs of emerging medical technologies.

5. Global Cooperation and Policy Development

- Addressing global medical challenges requires strong international collaboration.

Key Initiatives:
- **World Health Organization (WHO):** Plays a central role in coordinating global health responses.
- **Public-Private Partnerships:** Collaborations between governments, NGOs, and pharmaceutical companies accelerate medical advancements.
- **One Health Approach:** Integrates human, animal, and environmental health to prevent pandemics and address AMR.

Challenges
- Political and economic interests often hinder global health policies.
- Disparities in healthcare infrastructure between high- and low-income countries.
- Resistance to international health regulations in certain regions.

6. CONCLUSION

Public health strategies draw largely on quantitative methods-epidemiology, biostatistics, and economics. Clinical practice, including the practice of internal medicine, draws on a rapidly expanding knowledge base but remains focused on individual patient care; clinical interventions are rarely population-based. But global health equity depends on avoiding the false debates of the past: neither public health nor clinical approaches alone are adequate to address the problems of global health. There is a long way to go before evidence-based internal medicine is applied effectively among the world's poor. Complex infectious diseases such as HIV/AIDS and TB have proved difficult but not impossible to manage; drug resistance and lack of effective health systems have complicated such work. Beyond what is usually termed "communicable diseases"—i.e., in the arena of chronic diseases such as cardiovascular disease and mental illness—global health is a nascent endeavor. Efforts to address any one of these problems in settings of great scarcity need to be integrated into broader efforts to strengthen failing health systems and alleviate the growing personnel crisis within these systems.Such efforts must include the building of "platforms" for care delivery that are robust enough to incorporate new preventive, diagnostic, and therapeutic technologies rapidly in response to changes both in the burden of disease and in the needs not met by dominant paradigms and systems of health delivery.

Academic medical centers have tried to address this "know–do" gap as new technologies are introduced and assessed through clinical trials, but the reach of these institutions into settings of poverty is limited in rich and poor countries alike. When such centers link their capacities effectively to the public institutions charged with the delivery of health care to the poor, great progress can be made. For these reasons, scholarly work and practice in the field once known as "international health" and now often designated "global health equity" are changing rapidly.

That work is still informed by the tension between clinical practice and population-based interventions, between analysis and action, and between prevention and care. Once metrics are refined, how might they inform efforts to lessen premature morbidity and mortality rates among the world's poor? As in the nineteenth century, human rights perspectives have proved helpful in turning attention to the problems of the destitute sick; such perspec-tives may also inform strategies for delivering care equitably.A number of university hospitals are developing training programs for physicians with an interest in global health. In medical schools across the United States and in other wealthy countries, interest in global health has exploded. One study has shown that more than 25% of medical students take part in at least one global health experience prior to graduation. Half a century or even a decade ago, such high levels of interest would have been unimaginable.An estimated 12 million people die each year simply because they live in poverty.

An absolute majority of these premature deaths occur in Africa, with the poorer regions of Asia not far behind. Most of these deaths occur because the world's poorest do not have access to the fruits of science. They include deaths from vaccine-preventable illness, deaths during childbirth, deaths from infectious diseases that might be The field of medicine faces numerous global challenges, from pandemics to healthcare inequality and climate change-related health risks. However, advancements in technology, research, and policy offer hope for solutions. Addressing these issues requires a multifaceted approach involving governments, medical professionals, researchers, and the public. By prioritizing equitable healthcare access, ethical research, and sustainable policies, the global community can work toward a healthier and more resilient future

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