

Defining Noncommunicable Diseases

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In this opening lecture, we will define noncommunicable diseases, often referred to as NCDs, and situate them within the broader global health landscape. This definition is foundational for the course, because how we classify diseases shapes how we measure burden, set priorities, and design health systems and policies.

Noncommunicable diseases are commonly described as a group of chronic diseases. The term emerged as a way to summarize a wide range of long-duration conditions that are not transmitted from person to person and that share important clinical and population-level characteristics.

To understand where NCDs fit, it is helpful to start with how diseases and health conditions are traditionally organized in global health.

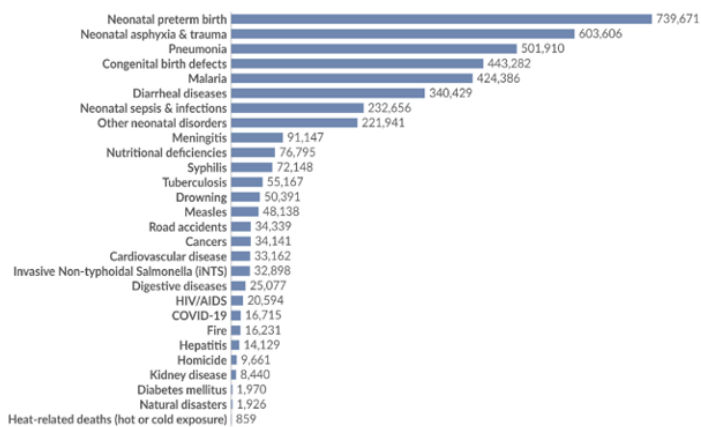
The Three Broad Groups of Diseases

Global health statistics typically categorize diseases and injuries into three broad groups.

Group 1 includes communicable diseases, maternal conditions, neonatal conditions, and nutritional deficiencies. These conditions are often infectious in nature or closely linked to pregnancy, childbirth, early childhood, and undernutrition. Historically, this group has been central to the global health agenda, particularly because it accounts for most child deaths globally.

GROUP 1

Causes of death in children under five, globally, 2021



Data source: IHME, Global Burden of Disease (2024)

OurWorldinData.org/causes-of-death | CC BY

Accounts for most
child deaths globally

Group 2 consists of noncommunicable diseases. These are chronic conditions that are not passed directly from person to person. This group includes cardiovascular diseases, cancers, diabetes and chronic kidney disease, and chronic respiratory diseases.

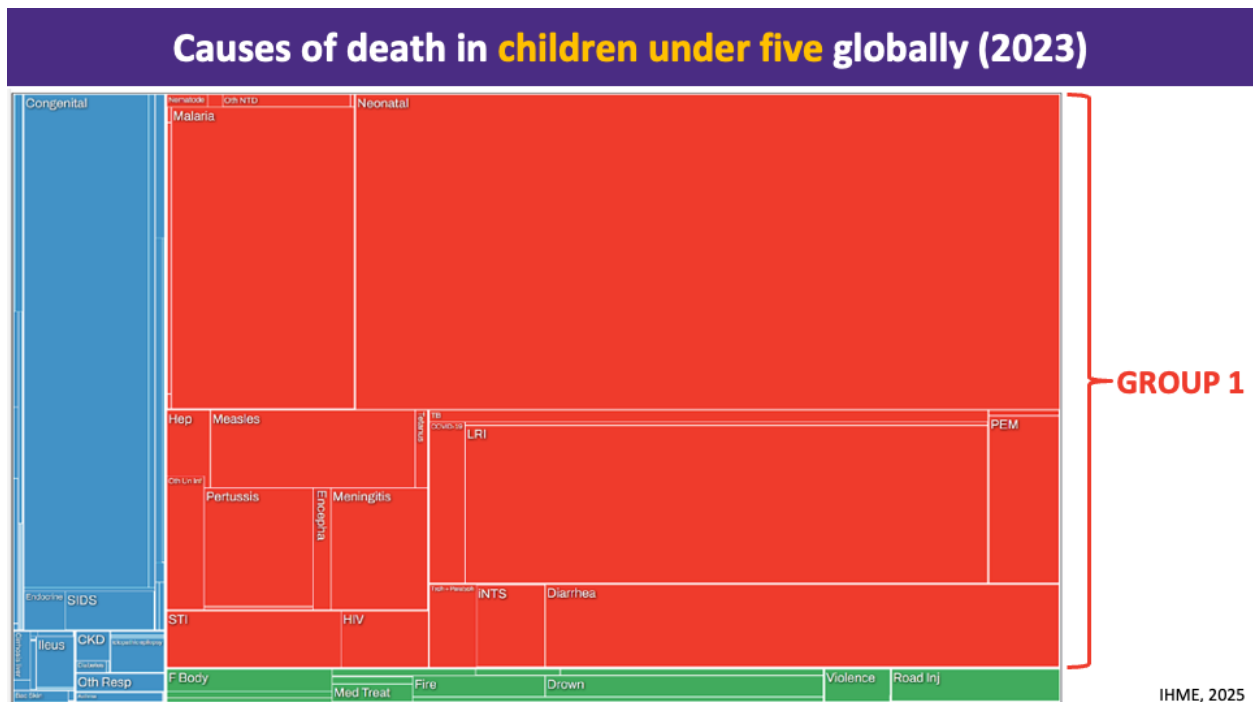
Group 3 includes injuries. These may be intentional, such as violence or self-harm, or unintentional, such as road traffic injuries, falls, or occupational injuries.

This three-group framework is widely used in global burden of disease analyses and provides a useful way to understand how patterns of illness and death vary across populations and over time.

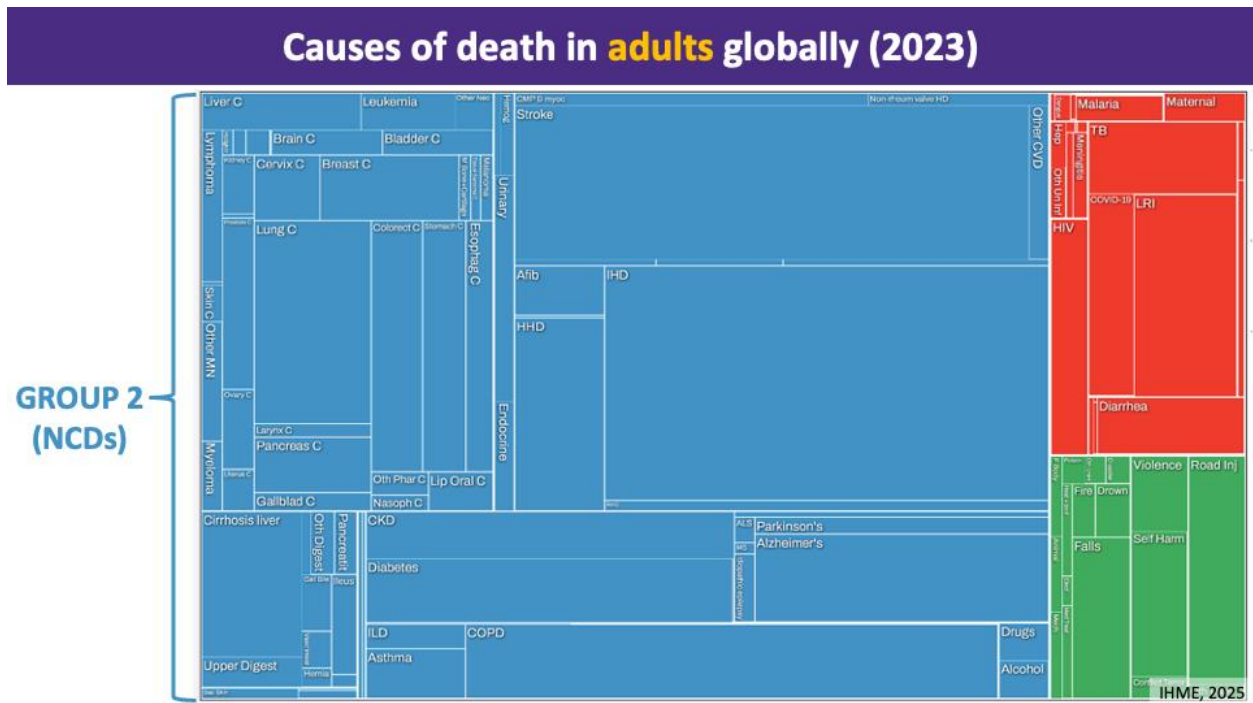
Why NCDs Matter

Now let's discuss why NCDs matter.

While most child deaths globally still occur due to Group 1 conditions,

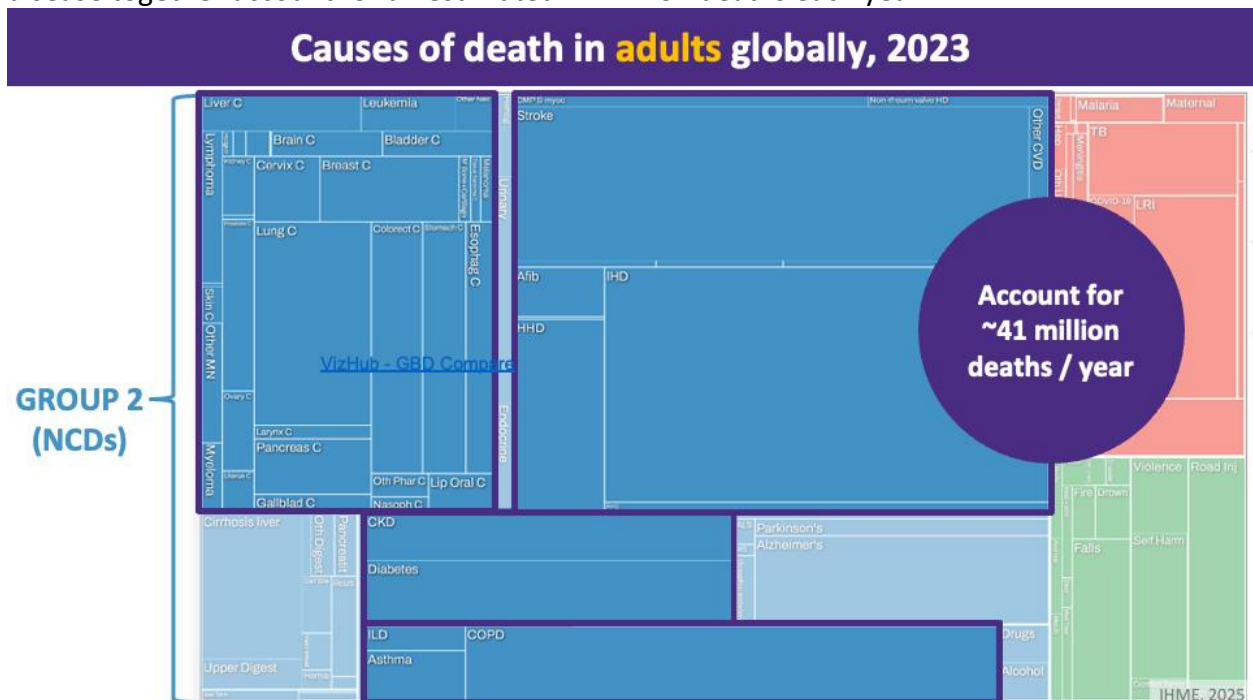


the picture changes dramatically in adulthood.



Approximately four out of five adult deaths worldwide are due to noncommunicable diseases.

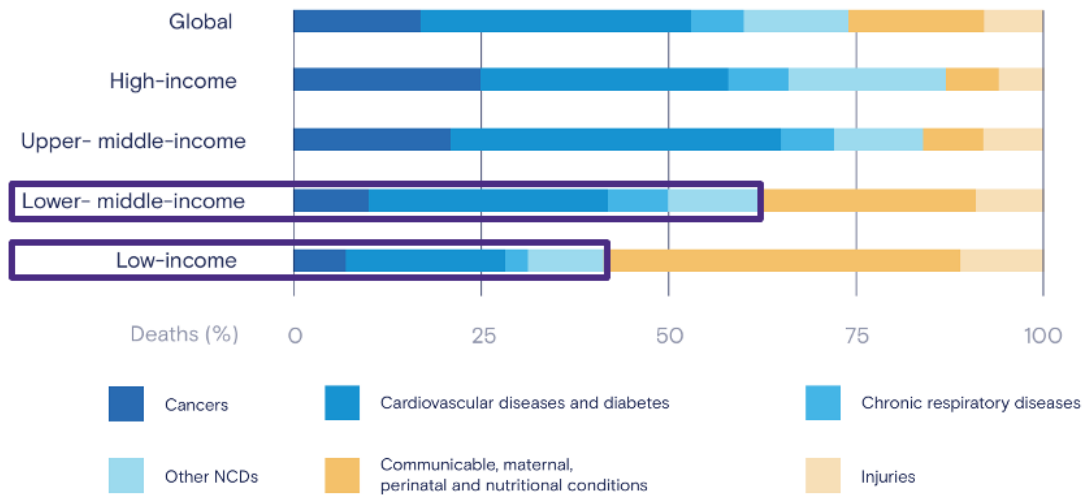
Cardiovascular diseases, cancers, chronic respiratory diseases, diabetes, and chronic kidney disease together account for an estimated 41 million deaths each year.



Among children, leading NCDs causing death include congenital birth defects, cancers (such as leukemias and tumors) and cardiovascular diseases.

Importantly, many of these deaths occur in low- and middle-income countries.

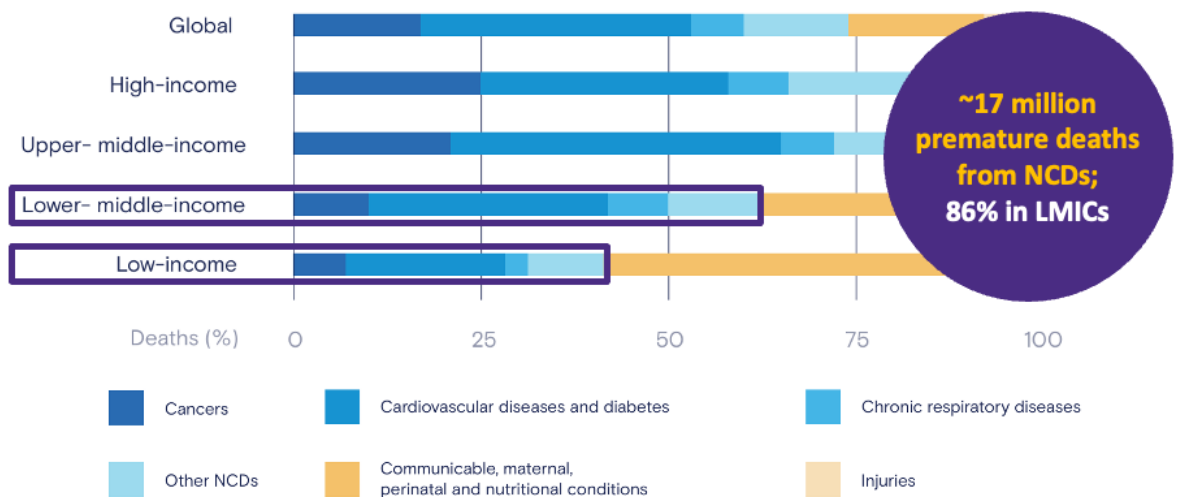
Share of deaths by cause, globally, according to income (2019)



WHO, 2022

In fact, approximately 17 million people died of NCDs before reaching the age of 70, with 86% of these deaths taking place in LMICs.

Share of deaths by cause, globally, according to income (2019)



WHO, 2022

From both a clinical and policy perspective, NCDs represent the dominant cause of morbidity and mortality globally and place sustained demands on individuals, families, health systems, and economies.

The "Four Major" NCDs

When NCDs are discussed in policy and programmatic contexts, there is often a focus on four major disease categories: cardiovascular diseases, cancers, diabetes and chronic kidney disease, and chronic respiratory diseases.

This grouping is not meant to suggest that other noncommunicable conditions are unimportant. In fact, NCDs include a much broader range of chronic conditions, such as neurological disorders, digestive diseases, skin conditions, and substance use disorders.

The emphasis on these four groups reflects a practical choice. Together, they account for roughly 80 percent of deaths within the noncommunicable disease category and share several characteristics that make them suitable targets for coordinated prevention and control efforts.

In global health policy, this focus was formalized by the World Health Organization through what became known as the **4x4 framework**.

The 4x4 Framework

Noncommunicable Diseases
4 Diseases, 4 Modifiable Shared Risk Factors

	Tobacco Use	Unhealthy diets	Physical Inactivity	Harmful Use of Alcohol
Cardio-vascular				
Diabetes				
Cancer				
Chronic Respiratory				

WHO, 2008

This framework paired these four major disease groups with four shared, modifiable risk factors: tobacco use, unhealthy diets, physical inactivity, and harmful use of alcohol. The core idea was that many of the leading NCDs are driven by overlapping risk factors, and that addressing these risks could reduce the burden of multiple diseases at the same time.

Recognizing the role of environmental risk factors such as air pollution, and to treatment of mental illnesses, the third UN High-Level Meeting on NCDs in 2018, committed to a shift to a "5 × 5" agenda including mental health conditions as a condition of focus and air pollution as a risk factor.

The 5x5 Framework

5X5

DISEASES



Cardiovascular Disease



Chronic Respiratory Diseases



Cancer



Diabetes



Mental and Neurological Conditions

RISK FACTORS



Unhealthy Diet



Tobacco Use



Harmful Use of Alcohol



Physical Inactivity



Air Pollution

Source: NCD Alliance, 2018

On the disease side, mental and neurological conditions were more explicitly included, reflecting both their contribution to global disability and their historical underprioritization in global health. On the risk factor side, air pollution was added alongside the original four, based on strong evidence linking it to cardiovascular disease and chronic respiratory disease, and to a lesser extent cancer.

These frameworks are not meant to capture all NCDs or all possible causes. Rather, they represent simplified ways of organizing a complex problem in order to support advocacy, prioritization, and policy action.

Over time, there was growing recognition that this framing was too narrow.

Heterogeneity Within NCDs

Even within these major categories, noncommunicable diseases are highly heterogeneous. Cardiovascular disease, for example, includes ischemic heart disease, stroke, hypertensive heart disease, and other conditions, each with distinct clinical pathways and management needs. Cancers encompass a wide range of diseases with different etiologies, treatments, and outcomes.

This diversity matters clinically. At the population level, however, these conditions are often grouped because they share common patterns of risk, long-term progression, and health system impact.

Shared Characteristics and Risk Factors

Now, let's focus on the shared characteristics and risk factors of NCDs.

Noncommunicable diseases tend to be chronic, developing over years or decades and requiring ongoing management rather than short-term treatment. They often involve complex care, including repeated interactions with the health system and, in many cases, multiple providers.

The risk of many NCDs increases with age, but these conditions are not confined to older populations. Increasingly, NCDs affect people during their working years, contributing to disability, productivity losses, and financial strain.

A key reason these conditions are grouped together is their shared risk factors. Tobacco use, unhealthy diets, physical inactivity, and harmful use of alcohol contribute, to varying degrees, across the major NCD categories. Environmental exposures and broader social and commercial determinants also play an important role.

From a public health and policy perspective, this shared risk factor framework is especially useful. It highlights opportunities for prevention and population-level interventions that can reduce the burden of multiple diseases simultaneously.

Clarifying Common Misconceptions

The term "noncommunicable" can be misleading. While these diseases are not transmitted from person to person, some are linked to infectious agents. Cervical cancer associated with human papillomavirus and liver cancer associated with hepatitis B are well-known examples. The key distinction is that the diseases themselves are not contagious, even when infectious exposures contribute to their development.

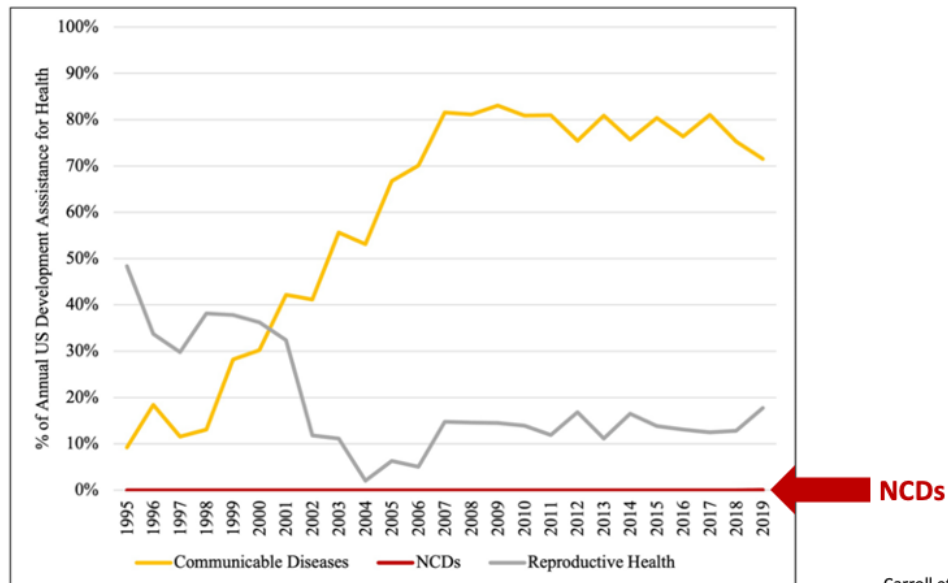
Another longstanding misconception is that NCDs are primarily the result of individual choice. This framing overlooks the powerful influence of social, economic, environmental, and commercial factors that shape risk and constrain individual behavior. Understanding these broader determinants is essential for effective prevention and control.

Why NCDs Were Historically Underprioritized

Let's talk about why NCDs were historically underprioritized.

For many years, noncommunicable diseases received relatively limited attention in global health policy and financing.

Trends in allocation of US funding for disease-specific interventions (1995-2019)



Carroll et al., 2024

This reflects a historical focus on conditions that primarily affected children and were perceived as more immediately preventable through short-term interventions. By contrast, NCDs were often viewed as complex, long-term conditions affecting adults and requiring sustained investment in health systems, prevention, and regulation. This perception contributed to delayed action, despite the growing burden.

Today, that imbalance is increasingly recognized, and NCDs are central to global health agendas, including universal health coverage and the Sustainable Development Goals.

Looking Ahead

As you move through this course, we will return to these definitions and frameworks repeatedly. Understanding what we mean by noncommunicable diseases, how they are grouped, and why they matter provides the foundation for examining prevention strategies, health system responses, and policy approaches across diverse settings.