



Beyond divisive dichotomies in disease classification

The divide between communicable and so-called non-communicable diseases (NCDs) is a pervasive, false dichotomy¹ of global health. We contribute to the debate on renaming NCDs² by proposing an integrating framework that considers both the nature of the disease and the characteristics of the required systemic response. In contrast to other renaming suggestions³ which tend to focus on dichotomy, we propose a framework that accounts for systemic responses to coexisting epidemiological profiles, comorbidities in patients, and sustained rather than episodic care.

Infections and NCDs were assumed to be unrelated, biologically or otherwise, which resulted in the opposing concepts of communicable versus non-communicable diseases. Scientific progress has, however, revived intellectual debate around the classification of diseases, questioned the distinct nature of infections and NCDs, and shown that most diseases have multiple causes.

Infections are not essentially discrete biological events or exclusive to the initial stages of health transition, but are part of a complex biological continuum and shifting epidemiological pattern.⁴ Many NCDs have an infectious origin. A fifth of cancers are the result of chronic infections caused by pathogens such as HIV and hepatitis B or hepatitis C virus,^{5,6} and bacterial and parasitic diseases catalyse NCDs, such as rheumatic heart disease and Chagas cardiomyopathy.

The dimension of space, especially as it relates to disease transmission, has often determined global health priorities. Literary accounts of disease dramatise the fear of contagion—eg, Edgar Allan Poe's *The Masque of Red Death*, Albert Camus's *The Plague*, or

Gabriel García Márquez' *Love in the Time of Cholera*. Fear of the spread of communicable diseases across national borders generates political urgency.⁷ Yet, space becomes relevant even for NCDs because living conditions and environments are social determinants of health.^{8,9}

The classification of diseases according to a single cause has reduced the scope of prevention, control, and treatment. Most health conditions are the product of multiple, interacting genetic, behavioural, environmental, and socioeconomic factors. In the 1950s, René Dubos wrote "The search for the cause may be a hopeless pursuit because most disease states are the indirect outcome of a constellation of circumstances rather than a direct result of single determinant factors."¹⁰

Classifying diseases on the basis of their duration has mistakenly equated the term communicable with acute, and non-communicable with chronic. Although many communicable diseases are acute, some are chronic, such as HIV. Additionally, several acute infections generate long-term sequelae, and some NCDs are characterised by acute exacerbations of underlying longer-term illnesses, such as asthma or depression.

Rather than a dichotomy, we propose a dynamic, nuanced classification framework that combines the disease duration and the multicausal transmission mechanism (table). The latter is crucial from an epidemiological point of view, whereas the disease duration is central

in designing health-system responses. Time is a continuous variable; however, a widely shared convention is to characterise a disease as either of short or long duration, and the nature of the required health-system response tends to be sufficiently different to justify categorising diseases as either acute or chronic.

Adopting two dimensions to stratify diseases generates a fourfold typology: communicable chronic diseases (CCDs), communicable acute diseases (CADs), non-communicable chronic diseases (NCDs), and non-communicable acute diseases (NADs). Retaining the abbreviations of these diseases preserves the known categorisation and acronym, but now the second letter refers to the crucial issue of chronicity. This framework integrates epidemiological and health-system issues, emphasises the complex and diverse origin of diseases, accommodates for change from scientific discovery and technological progress, and offers a set of acronyms that expresses the complexity of disease patterns.¹²⁻¹⁷

Consider the advantages of this classification when applied to HIV/AIDS. From an epidemiological control point of view, the fact that HIV/AIDS is communicable is hugely relevant, but from a health-system perspective, chronicity is key as patients live with multiple, acute complications and comorbidities.^{18,19}

The debate on nomenclature offers a unique opportunity to secure a more balanced and integrated approach

	Communicable or associated with infection	Non-communicable
Chronic	Communicable chronic diseases (CCDs): cancers associated with infections or parasitic diseases (eg, Kaposi sarcoma, lymphoma); chronic infections (eg, tuberculosis, HIV/AIDS); acute infections or parasitic diseases with chronic sequelae (eg, polio, measles)	Non-communicable chronic diseases (NCDs): Cancers (eg, breast or lung); cardiac and pulmonary diseases (eg, congestive heart failure or hypertension); other chronic diseases with acute exacerbations (eg, asthma and depression)
Acute	Communicable acute diseases (CADs): most common infections (eg, infectious diarrhoeal disease, acute respiratory infections, or malaria)	Non-communicable acute diseases (NADs): cancers (eg, acute myelogenous or lymphoblastic leukaemia); cardiac diseases (eg, acute myocardial infarction)
Proposed framework for the classification of diseases with examples. Adapted from reference 11, with permission from the Presidents and Fellows of Harvard College.		
Table: Typology of disease by duration and mode of transmission		

to setting global health priorities. This framework can supersede simple dichotomies and strengthen our ability to address the complex health challenges facing us at the present time.

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