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Perspectives

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Realigning noncommunicable disease monitoring with health systems priorities in the Africa region

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Abstract

The African region of the World Health Organization (WHO) recently adopted a strategy aimed at more comprehensive care for noncommunicable diseases (NCDs) in the region. The WHO's World Health Assembly has also newly approved several ambitious disease-specific targets that raise the expectations of chronic care and plans to revise and update the NCD-Global Action Plan. These actions provide a critically needed opportunity for reflection and course correction in the global health response to NCDs. In this paper, we highlight the status of the indicators that are currently used to monitor progress towards global goals for chronic care. We argue that weak health systems and lack of access to basic NCD medicines and technologies have prevented many countries from achieving the level of progress required by the NCD epidemic, and current targets do little to address this reality. We identify gaps in existing metrics and explore opportunities to realign the targets with the pressing priorities facing today's health systems.

Keywords: noncommunicable disease, health systems, monitoring, performance, global health

BACKGROUND: NCD BURDEN AND CURRENT MONITORING FRAMEWORKS

Noncommunicable diseases (NCDs) are a leading cause of global mortality and morbidity and account for more than 40 million deaths per year (Institute for Health Metrics and Evaluation (IHME), 2019). NCDs are a diverse group, comprising cancers, cardiovascular disease, chronic respiratory disease and diabetes, as well as a wide range of endocrine, neurological and musculoskeletal conditions. Diagnosis and management of these conditions require a range of different skills, technologies and infrastructure. Once diagnosed, patients must manage their conditions, acutely aware of the importance of sustained therapy and the risk of severe complications should their conditions go uncontrolled. The long-term nature and unpredictable disease trajectories of many NCD diagnoses place unique pressures on the health system. These pressures include the organizational capacity, infrastructure and competency to actively monitor clinical states and adjust therapeutic regimens

Contribution to Health Promotion

- Noncommunicable diseases (NCDs) are a major global challenge. They encompass diverse conditions with complex diagnosis and management requirements.
- Current global monitoring frameworks for NCDs lack inclusivity and fail to address the unique needs of vulnerable populations in low and lower-middle-income countries, where the burden of NCDs is highest.
- To improve accountability and address these limitations, there is a need for more comprehensive monitoring of NCDs, including the full continuum of care, effective coverage, and health system capacity to deliver services for chronic conditions. Such improvements can lead to targeted enhancements in health systems, especially for the most marginalized populations.

appropriately. Health systems must also have structures to refer, link and retain patients in care.

Faced with an ever-growing burden of NCDs, the global community has organized itself around core targets related to global morbidity and mortality (United Nations General Assembly, 2015; World Health Organization, 2021a). The adoption of such targets is important for aligning global public health efforts and mobilizing action. For the past decade, the NCD Global Action Plan (NCD-GAP) for 2013–30 has been at the center of efforts to translate global priorities into action on the ground. This document was developed by the World Health Organization (WHO) to provide clear policy guidance to governments seeking to strengthen national programs (World Health Organization, 2013). (The period covered by the NCD GAP was extended to 2030 by the 72 World Health Assembly (WHA) to align it with the 2030 Agenda for Sustainable Development: WHA72/2019/REC/1, decision WHA72(11).) The plan focuses on five conditions—cardiovascular disease, cancer, diabetes, chronic respiratory disease and mental health conditions—as well as five modifiable risk factors—tobacco use, physical inactivity, unhealthy diet, alcohol use and air pollution—the so-called '5 × 5' approach, associated with a large disease burden. The policies laid out by the NCD-GAP seek to avoid premature mortality via behavior change to prevent disease and strengthen primary care to control disease.

Despite these steps, there is concern that the global NCD community's heavy focus on lifestyle changes and primary health services fails to reflect the unique needs of the most vulnerable populations, including those living in low and lower-middle income countries (LLMICs), where gaps in care are largest and where the epidemiology of NCDs differs from the global burden (Bukhman *et al.*, 2020; Coates *et al.*, 2021; World Health Organization, 2021b). Advocates worry that the health systems response outlined by the NCD-GAP excludes the broader constellation of NCD health concerns of those living in extreme poverty, where the NCD epidemic is more heterogenous, and the array of environmental and genetic risks more diverse than that found among the more affluent populations for which the strategy was initially developed (Bukhman *et al.*, 2020).

In recognition of these limitations, support for more comprehensive NCD care in LLMICs has been growing. The WHO Africa Regional Office recently adopted a PEN-Plus strategy to address severe NCDs at first-level hospitals in its 47 member states (WHO Regional Committee for Africa, 2022). These actions provide a critically needed opportunity for reflection and course correction in the global health response to NCDs. In this paper, we make a case for more expansive goals, with an intensified monitoring of the health sector response. In the following sections, we first summarize the status of the major global NCD targets embedded in the United Nation's Sustainable Development Agenda and the WHO's NCD Global Monitoring Framework (NCD-GMF). We then identify gaps in these targets, with a focus on the health system determinants—the availability of critical drugs and diagnostics and effective access prioritized health services—and opportunities to realign them with the evolving priorities in today's NCD epidemic.

Status of the global NCD agenda

Two key monitoring frameworks are used to track global progress on NCDs. The first is the multisectoral Sustainable Development Agenda, which was adopted by the UN's General Assembly in 2015 to define the global development priorities through 2030. Among its 17 interlinked global Sustainable Development Goals (SDGs) goals, SDG 3 is focused on health outcomes and includes 13 targets that are measured using 28 indicators. Of these, SDG 3.4 focuses on NCDs and mental health. The second monitoring framework is the NCD-GMF, which was adopted by the WHO's World Health Assembly (WHA) to track the performance of NCDs. It consists of nine voluntary targets tracked using 26 indicators. The NCD indicators included in these frameworks can be broadly divided into three groups: population health outcomes, behavioral risk factors and health systems determinants. Figure 1 provides a visual overview of these targets and associated indicators, and how they map to each of these three groups.

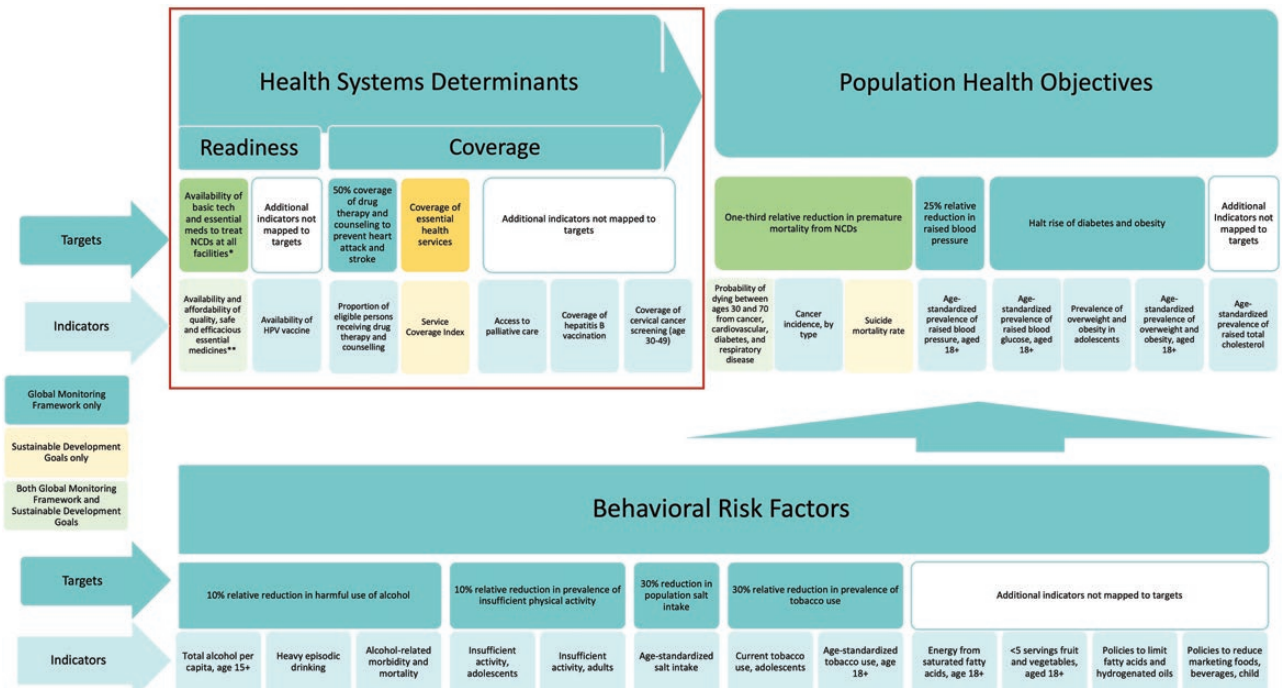

Fig. 1: Targets and indicators of the NCD Global Monitoring Framework (NCD-GMF), and their overlap with the Sustainable Development Goals (SDGs). NCD-GMF targets can be organized into three groups: indicators monitoring the health systems, those monitoring behavioral risk factors and those related to population health objects. As is indicated in the figure, population health outcomes are impacted by both the health system and underlying population behaviors. Nine NCD-GMF targets (darker colors) are linked to 25 indicators (lighter colors). Blue fill is used for targets and indicators that are monitored by the NCD-GMF only, yellow fill is used for those monitored by the SDGs only, and green fill is used for those that are monitored by both. *,**The GMF and SDG frameworks define essential medicines differently.

Both the NCD-GMF and SDG 3.4 call for a one-third reduction from a 2015 baseline in mortality due to cancer, cardiovascular disease, diabetes and respiratory disease among individuals between ages 30 and 70. Although progress on this indicator is moving in the right direction, the global pace of decline would need to more than triple in order to reach this goal (World Health Organization, 2021c). The world is also off-target in the corollary goals aimed at reducing the prevalence of individual NCDs and their cardiometabolic risk factors. While the NCD-GMF calls for a 25% relative reduction in the prevalence of hypertension, official figures have remained stable over the past several decades as declines in higher-income settings have been offset by increases in LLMICs (Zhou *et al.*, 2021). Global targets calling for a halt in the rise of both obesity and diabetes rates are also unlikely to be met, with fewer than 10 countries worldwide expected to meet the goal (Zhou *et al.*, 2016; Lin *et al.*, 2020).

Behavioral risk reduction is central to the global fight against NCDs, and the frameworks articulate several goals related to alcohol, tobacco use, physical lifestyle and diet. While most regions of the world, including Africa, are on track to meet the targeted reduction in consumption of tobacco by 30% by 2025, other targets have remained out of reach (World Health Organization, 2021d). A recent study of adolescents across 140 countries found very high rates of each of these risk factors among young populations. Across all regions of the world, there is near universal exposure to at least one risk factor and there is a year-on-year increase in the proportion of adolescents exposed to multiple risks (Biswas *et al.*, 2022).

Risk reduction does not guarantee the total prevention of NCDs. Countries must also respond to the needs of existing NCD patients and invest in robust health systems critical to reducing mortality. In recognition of this, health systems monitoring is embedded in both the SDGs and the NCD-GMF. Target 8 in the NCD-GMF calls for 50% coverage of drug therapy and counseling to prevent heart attacks and strokes. In 2019, just 34% of countries met this target. Achievement of Target 8 is highly correlated with national income, with no low-income country achieving the target (WHO Evaluation Office, 2020). Monitoring of clinical inputs to these services also suggests issues. One analysis of survey data from 25 lower- and middle-income countries illustrates both significant variability and large ongoing gaps in access. In more than one-quarter (28%) of countries, not a single surveyed facility stocked all medicines. In the country with the highest overall availability of these supplies, fewer than 70% of facilities stock the complete set of essential medicines (World Health Organization, 2021b).

SDG monitoring of the health system is embedded in SDG 3.8, which formally calls on the international community to deliver universal health coverage (UHC). This complex goal, which seeks to expand access to health care while protecting vulnerable populations from medical impoverishment, cuts across disease and health systems priorities. It is assessed, in part, using the wide-ranging UHC-Service Coverage Index (SCI). The SCI tracks coverage of several key services linked to maternal and child health, infectious disease and NCD care. Judged by this metric, efforts to ensure global access to UHC are significantly off-track. The WHO's interim goal of expanding UHC to a billion individuals by 2023 (identified as a goal in its 2025 Global Program or Work) illustrates the extent of the challenge (World Health Organization, 2020). As of 2021, the world was projected to be less than a third of the way to the stated goal (World Health Organization, 2021b). Of the disease domains tracked, gaps in coverage are the largest for NCDs.

Ten years after the formal adoption of these targets, the NCD burden continues to grow, and there is increasing concern that the targets are insufficient and failing to create accountability and mobilize action.

NCD outcome monitoring through an equity lens

There is a risk that the slow pace of global progress on NCD control masks a larger problem. Current targets exclude a large proportion of the NCD disease burden, including the impact of a diverse group of neurological, musculoskeletal, endocrine, circulatory, skin, renal, sensory and gastroenterological disorders. Many of these are chronic conditions, requiring longitudinal care and lifelong access to therapeutics. This is particularly important in lower-income countries, where the disease burden is more heterogenous, often occurs at a younger age and causes more severe illness (Bukhman *et al.*, 2020). In LLMICs, almost 60% of the NCD burden falls outside of current global targets on NCD mortality, which focus on deaths between ages 30 and 70 and those linked to four specified conditions. Figure 2 contextualizes this figure by situating this mortality in the greater burden of all-cause mortality (left) and morbidity (right) (Institute for Health Metrics and Evaluation (IHME), 2019). The large number of often severe NCD conditions impacting this population has been described as a 'long tail' of the disease burden. Numerous conditions such as sickle cell disorders, rheumatic heart disease and type 1 diabetes are not amenable to measurement via population surveys or monitoring within a concise framework. Untracked, this burden has remained largely under the radar of the global agenda (Institute for Health Metrics and

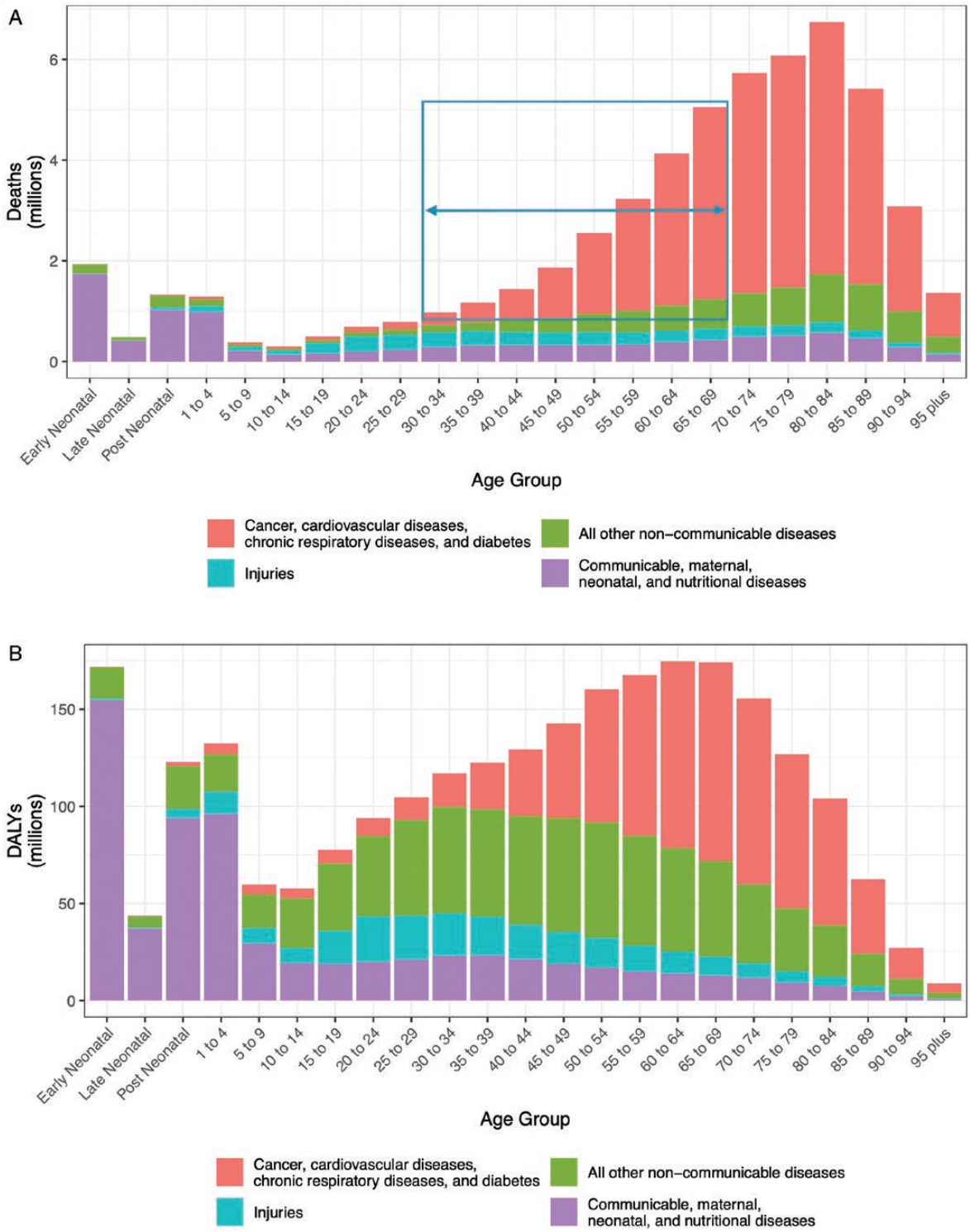

Fig. 2: Global burden of disease: current monitoring frameworks monitor deaths from cancer, cardiovascular disease, respiratory disease and diabetes that occur between the ages of 30 and 70 (pictured in red within the blue box, left). Deaths from all NCDs outside of this group (illustrated in green) and all deaths outside of this age range are excluded. The impact of focusing on the four conditions is evident when considering the broader burden of NCDs, as illustrated with DALYs (right). 'Other' NCDs, again illustrated in green, account for a large burden of non-fatal disease across the lifespan.

Evaluation (IHME), 2019). As a result, the focus on four major disease groups disproportionately excludes the experience of the poorest and most vulnerable populations (Bukhman *et al.*, 2020).

This issue is exacerbated by the way in which the core target is defined. In so focusing exclusively on mortality, the target fails to reflect the significant, often lifelong, impact that living with NCDs can have on well-being (Reddy, 2020). The indicator also fails to capture the excess mortality associated with the diseases. For instance, people with schizophrenia have much higher mortality risk than people without schizophrenia, but zero deaths are attributed to the condition in the GBD (Vigo *et al.*, 2016). The narrow focus on ages 30-to-70 further excludes and devalues disease at both ends of the life table (Pearce *et al.*, 2015). NCDs among the young are entirely excluded from the target, even though in LLMICs annual deaths from NCDs among those aged 40 and younger outnumber the deaths from HIV, tuberculosis and maternal causes, combined (Institute for Health Metrics and Evaluation (IHME), 2020). Indeed, of the NCD deaths occurring between ages 5 and 30, only those affecting women during the perinatal period are currently observed in any major effort to track mortality. The experience of older individuals is similarly excluded, with the decision to adopt mortality as the core metric of success. Nearly a fifth of the total burden of disease occurs among people over age 70, and NCDs account for the largest burden of disease in this group. Much of this burden could be avoided with effective primary, secondary and tertiary prevention (Prince *et al.*, 2015). The experience of Figure 2, below, contextualizes this broader burden.

In adopting a regional strategy for the management of severe NCDs, the Africa Regional Office of the WHO is highlighting the need for health systems in its region to better respond to this complex NCD disease burden. We suggest that this strategy should be supported with more expansive monitoring and the introduction of thoughtful targets that focus on providing care for people with chronic diseases. Intensified monitoring of NCD outcomes is one important component of this effort.

We argue that these metrics should be expanded to also examine all-cause NCD morbidity. mortality, and outcomes across the lifespan. Given the known interplay between access to resources and disease outcomes, we also argue that outcomes should be disaggregated to document inequities (Bukhman *et al.*, 2020). Disaggregation, for example, by sex, location or socioeconomic status, is critical for ensuring that important variations across population groups are tracked. Finally, we note the large impact of living with a chronic disease on all aspects of life. Living with chronic disease can adversely impact on socioeconomic status of households through both direct and indirect pathways. Families may be burdened with significant medical debt as poor health forces them out of the workforce (e.g. Murphy *et al.*, 2020). We advocate for indicators that can assess the extent to which persons living with NCDs are able to fully participate in routine activities, including in the workforce. This could be achieved through the inclusion of a limited number of practical outcomes that are key in people living with chronic conditions, such as missed school or work, or frequency of hospitalizations.

Gaps in health systems monitoring

Careful examination of the SDG-SCI highlights the degree to which NCD monitoring falls behind that of other global priorities. This indicator reflects a broad spectrum of clinical needs—including maternal and child health (MCH), infectious disease, and NCDs—and complements coverage indicators with measures of financial risk protection. Figure 3 details how each of the four domains of the SCI are monitored. However, the effort to track NCDs within this framework is ultimately undermined by the selection of weak proxy tracer items to measure the coverage of NCD services. These are: (i) prevalence of raised blood pressure, (ii) the prevalence of diabetes, and (iii) the prevalence of nonuse of tobacco. Although interventions addressing these behaviors and conditions are cost-effective, none of the three indicators provide a valid metric of service coverage. Rather than direct measures of health service access, the first two reflect a combination of prevention and control measures representing a mix of environmental, cultural, behavioral and clinical considerations. The third tracer—tobacco nonuse—is strongly shaped by policy decisions determined outside the health sector. These proxy measures stand in sharp contrast to the indicators selected to assess MCH and infectious disease care, which combine measures of coverage and effective coverage for essential services.

The other health systems indicators considered in the global NCD frameworks focus on relatively inexpensive services that can be delivered at the primary level. Figure 4 maps out health systems indicators from the NCD-GMF to the continuum of care and prevention. Vaccination targets primary prevention, and screening for cervical cancer and drug therapy to prevent heart attacks and strokes are both aimed at secondary prevention—avoiding more severe disease. The drugs included in the essential package, too, are focused on less severe disease, as they are designed to reflect a minimum standard of primary care. Of the six indicators, only 'access to morphine for palliative care' falls clearly in the realm of tertiary prevention, which focuses on

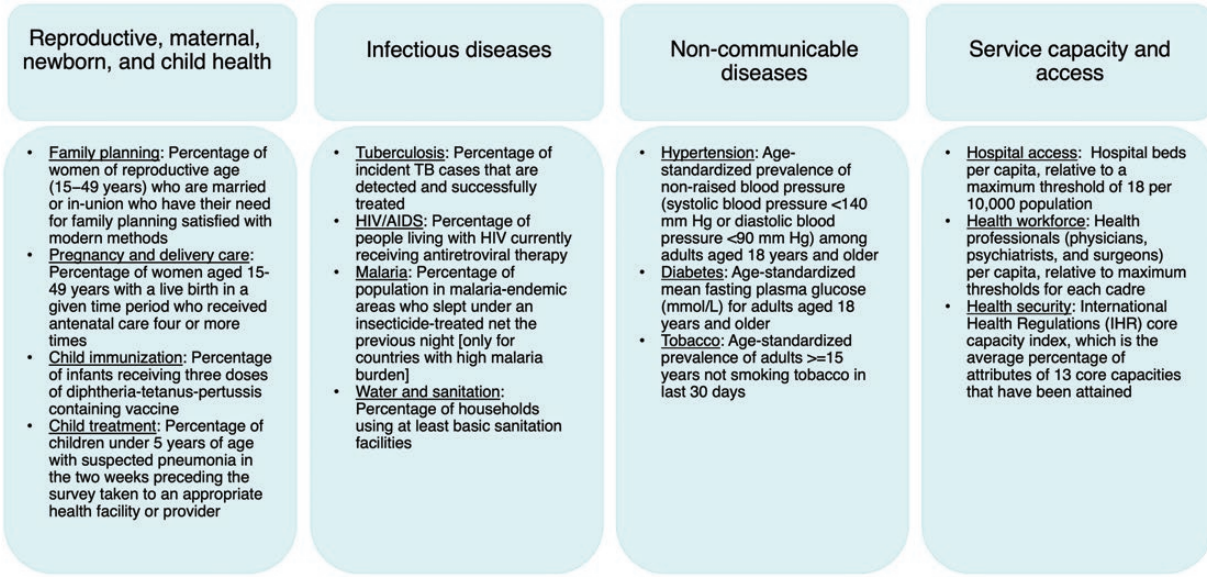

Fig. 3: The four domains of the Service Coverage Index. Progress against the goal for Universal Health Coverage (UHC) is measured as the geometric mean of 14 tracer indicators across four domains: Reproductive, maternal, newborn and child health; (2) infectious disease; (3) noncommunicable disease; and (4) service capacity and access.

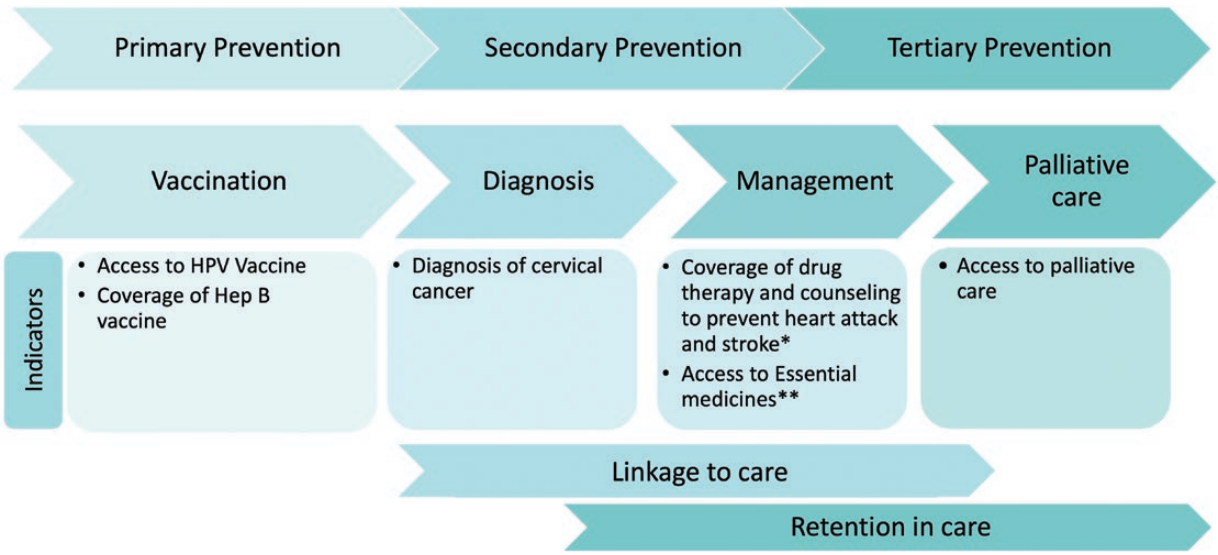

Fig. 4: Mapping of six health systems indicators included in the NCD Global Monitoring Framework (NCD-GMF) to the continuum of care and prevention. Of the 25 indicators included in the NCD-GMF, only six provide a measure of the health system's capacity and performance in addressing NCDs. Only the two management indicators (bolded) are mapped to quantified targets. Bolded indicators are mapped to quantified targets as follows: *Coverage of eligible persons with drug therapy to prevent heart attack and stroke is mapped to the NCD-GMF target calling for 50% coverage of drug therapy and stroke. **Access to essential medicine is mapped to the NCD-GMF target calling for the availability of essential medicines and technologies at 80% of public and private facilities.

management of later stages and more complex disease. These targets neither extend to medical management of severe disease nor are they designed to assess the ability of the health system to respond to the unique pressures of delivering services for chronic conditions by testing linkage to referral services or retention in care. They exclude higher-cost services for severe conditions that are responsible for an outsized share of health-related

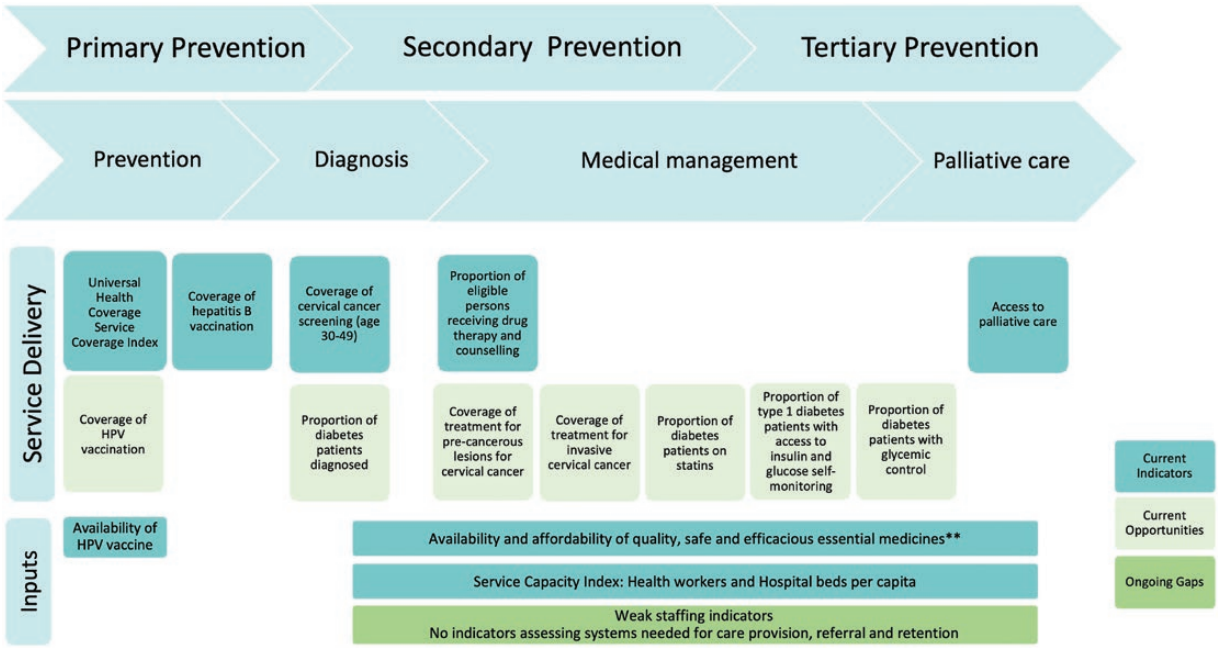

Fig. 5: Existing indicators, current opportunities, and ongoing gaps in global noncommunicable disease (NCD) monitoring. Current indicators are indicated in dark blue. A number of indicators have recently been adopted by the World Health Assembly, but are not reflected in major monitoring frameworks. These represent current opportunities and are indicated in light green. Indicators developed to support cervical cancer and diabetes initiatives illustrate current opportunities to strengthen global monitoring frameworks and are indicated in light green. Ongoing gaps in monitoring are highlighted in dark green.

impoverishment and individual burden (Jaspers *et al.*, 2015; Jan *et al.*, 2018).

NCDs require the full continuum of care and prevention. Simpler conditions should be managed to prevent more severe disease. More severe conditions must be managed to prevent deaths and to minimize the negative impact on health and well-being, including school and work absences. The continuum extends to palliation and end-of-life care for patients with the most severe disease. The current indicators illustrate just a sliver of that care.

Improving monitoring for increased accountability

The WHA has recently adopted several new disease-specific targets related to the four NCDs included in the NCD-GAP, including those for cervical cancer and diabetes (World Health Assembly, 2020; World Health Assembly, 2022a). A WHO-led review of hypertension targets is expected later this year, and there are ongoing efforts to refine programmatic indicators, such as those embedded in the WHO's HEARTS program, an approach to improving cardiovascular care whose; the name reflects the six component modules: healthy-lifestyle counseling; evidence-based treatment protocols; access to essential medicines and technology, risk-based CVD management; team-based care; and systems for monitoring. At the same time, new targets aimed at eye care and the launch of a global action plan to address epilepsy highlight the expanded scope of global NCD action (World Health Assembly, 2021; World Health Assembly, 2022b). In alignment with global efforts to monitor the quality of care, newly adopted indicators increasingly move beyond measures of availability and instead seek to monitor effective and timely access to services among the population in need (Ng *et al.*, 2014; Kruk *et al.*, 2018).

While the indicators linked to these new initiatives were not designed to track either the NCD-GMF or the SDGs, they represent important opportunities to increase accountability for NCD care and treatment and should be leveraged to strengthen the two frameworks. Figure 5 highlights the degree to which the adoption of these new targets has expanded the scope and depth of NCD monitoring. Existing and new interventions are classified either as inputs to care or metrics of service delivery. They are then aligned according to the continuum of care to reflect the range of services from prevention to diagnosis, management (simpler to more complex), and, ultimately, palliative care. The figure illustrates the extent to which new indicators offer greater visibility into service delivery across the continuum of care. This growing repository of monitoring

indicators for NCD care represents an opportunity to better align the metric with the more expansive spirit of UHC, as well as with the MCH and infectious disease tracers already in place.

Additional improvements could come from a more robust definition of existing indicators. The limitations of using inputs to measure health sector performance have been well articulated elsewhere (e.g. Kruk *et al.*, 2018). Nonetheless, we argue that strengthening these indicators designed to monitor readiness to deliver NCD care—for example, by documenting a more diverse array of inputs with a sharper focus on the continuum of care—would offer important insights into the sector's potential capacity.

Ultimately, however, health systems indicators should shift away from monitoring inputs to assessing the extent to which health systems are providing care. An increased reliance on metrics of effective coverage is one important strategy that would bring NCD monitoring into better alignment with other efforts to monitor progress on global health priorities. However, doing so raises the significant challenge of quantifying the population in need of any service. A practical first step would be to emphasize better documentation of the number of people accessing high-priority care in the short term. In so doing, care should be taken to reflect the continuum of care, and to embed a test of the system's capacity to link patients to referral services and maintain patients in care over time.

While there is an urgent need to better track the numbers of patients in care, the diversity of the NCD disease group highlights the importance of developing more generalized metrics of health systems' capacity to deliver services for chronic conditions more generally. This could include, for example, separately examining the number of generalist and specialist health workers per capita working in primary, secondary, and tertiary care, by monitoring the presence of a functioning referral system. As many NCDs are chronic and lifelong conditions, it is important to track progress over time. Indicators around health system processes of referrals, loss to follow-up, and retention of both patients and staff are important. Additionally, tracking of clinical prognoses and need for advanced care like hospitalizations and surgery are key to understanding the areas of the health systems that could be strengthened and/or integrated. Complementary to coverage indicators, measures of financial risk protection should be included, as good quality disaggregation of indicators by social, economic and demographic variables is imperative in ensuring equitable access to NCD treatment. These, in turn, can be fed into national priority-setting efforts.

Practical next steps

The discussion above lays out a vision for substantial improvements to monitoring of NCD care. A number of specific recommendations have been laid out in the paragraphs above, and are summarized in Table 1.

Achieving this vision will require significant resources. Data collection and availability limitations that have undermined efforts to assess performance and track progress against even the relatively parsimonious global targets need to be addressed (Sornpaisarn *et al.*, 2023). Efforts to expand treatment should be linked with investments in data systems that allow for a progressive realization of this vision. As health systems and monitoring capacities continue to develop, the emphasis should shift to more ambitious quality-adjusted process and outcome metrics that address the coverage, impact, and experience of NCD care.

CONCLUSION

With less than a decade remaining on the clock, few countries have achieved the level of progress required to meet global targets. Weak health systems are an important driver of this lackluster performance. Much of the global population lacks access to even basic NCD medicines and technologies. This is particularly true for the poorest and most vulnerable, who often face not only a distinct disease burden but also significant issues in accessing care. Major monitoring frameworks have served to obscure important inter- and intra-country variations in the underlying risks and epidemiology of NCDs. The recent adoption of a regional strategy to address severe NCDs across the African region represents an important effort to redress this gap. We argue that this effort offers an opportunity to demand more of the systems established to track this care. Such an effort would enable a more inclusive accounting of the burden among the poor and, ultimately, would drive targeted improvements in the health systems that are responsible for delivering health care to the world's poorest populations. Through this, we hope to realign the global efforts around the goals of an inclusive and united NCD agenda, with the breadth, depth, and scope encompassed by UHC, and with the values embedded in the SDG's promise to leave no one behind.

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All authors are contributors to this research, drafting, and finalization of this manuscript.

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Table 1: Summary findings—problems and opportunities to strengthen NCD monitoring

Problem	Opportunity	Examples
Current targets exclude a large proportion of the NCD disease burden and focus mainly on prevention and less severe disease	• Expand monitoring frameworks to include all-cause NCD morbidity and mortality • Incorporate a deliberate focus on severe conditions	• Chronic neurologic, musculoskeletal, skin, renal and gastrointestinal disorders • Type 1 diabetes, Sickle cell disease
Mortality is featured as the key metric of success	• Incorporate measures of financial risk protection • Broaden to include outcomes across the lifespan and outcomes impacting day-to-day life	• Out-of-pocket spending • Pain control • Missed school and work • Hospitalization episodes
Current efforts fail to reflect the unique challenges that NCDs place on the health sector and do not focus on the continuum of care	• Document a more diverse array of inputs with a sharper focus on the continuum of care • Document critical downstream elements like medical management • Incorporate explicit monitoring for functioning referral systems	• Number of generalist and specialist health workers per capita working across each level of care • Patient retention in care over time • Patient linkage to referral services • Recurrent hospitalizations • Availability of targeted drugs/diagnostics at each level of care
Existing targets obscure important inter- and intra-country variations in the underlying risks and epidemiology of NCDs	• Use information on local epidemiology to guide priority setting and targets • Improve in-country data systems to allow for disaggregation	• Incorporate a broader set of NCDs, especially those more severe and/or affecting young people, into population surveys and surveillance • Disaggregation by geography, age, sex • Disaggregation by socioeconomic status
Data availability limitations undermine efforts to assess performance and track progress against global targets	• Link investments in care to improved data systems and capacity • As data systems grow, intentionally incorporate recommendations as above	• Broader set of diagnoses • Disaggregation by socioeconomic status

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