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Monitoring Sustainable Development Goal 3: how ready are the health information systems in low-income and middle-income countries?

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ABSTRACT

Sustainable Development Goals (SDGs) present a broader scope and take a holistic multisectoral approach to development as opposed to the Millennium Development Goals (MDGs). While keeping the health MDG agenda, SDG3 embraces the growing challenge of non-communicable diseases and their risk factors. The broader scope of the SDG agenda, the need for a multisectoral approach and the emphasis on equity present monitoring challenges to health information systems of low-income and middle-income countries. The narrow scope and weaknesses in existing information systems, a multiplicity of data collection systems designed along disease programme and the lack of capacity for data analysis are among the limitations to be addressed. On the other hand, strong leadership and a comprehensive and longer-term approach to strengthening a unified health information system are beneficial. Strengthening country capacity to monitor SDGs will involve several actions: domestication of the SDG agenda through country-level planning and monitoring frameworks, prioritisation of interventions, indicators and setting country-specific targets. Equity stratifiers should be country specific in addressing policy concerns. The scope of existing information systems should be broadened in line with the SDG agenda monitoring requirements and strengthened to produce reliable data in a timely manner and capacity for data analysis and use of data built. Harnessing all available opportunities, emphasis should be on strengthening health sector as opposed to SDG3 monitoring. In this regard, information systems in related sectors and the private sector should be strengthened and data sharing institutionalised. Data are primarily needed to inform planning and decision-making beyond SGD3 reporting requirements.

Key questions

What is already known about this topic?

- Sustainable Development Goals (SDGs) present monitoring challenges to information systems especially in low-income and middle-income countries given the broad scope, the need for a multisectoral approach and the emphasis on equity.
- The narrow scope and weaknesses in existing health information systems, the lack of capacity for data analysis and a multiplicity of data collection systems designed along disease programs are among the limitations that need to be addressed in order to strengthen monitoring of SDG3.
- Strong country leadership prioritising longer-term country capacity building as opposed to urgent needs for data, a comprehensive approach to strengthen a unified health information as opposed to selective approaches focusing on specific data needs and sustained country support coupled with shared responsibility and accountability are among the positive lessons countries can pursue.

What are the new findings?

- The emphasis on equity calls for a multisectoral approach to improving health with implications for reporting on health-related actions and the generation of disaggregated data.
- Equity stratifies of interest should be country specific in addressing parameters of policy relevance.
- Strengthening information systems to assess performance of SDG3 targets should not be pursued at the expense of strengthening a comprehensive information system to assess health sector performance.

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INTRODUCTION

Majority of countries have signed up to the Sustainable Development Goals (SDGs), which present a broader scope and take a holistic multisectoral approach to development, as opposed to the Millennium Development Goals (MDGs).[1] In reference to health, while keeping the health MDG agenda, SDGs embrace the growing challenge of non-communicable diseases (NCDs) and their risk factors, with clear targets and indicators. SDGs are interdependent; the attainment of targets in one goal contributes to the attainment of the targets in other goals. Relatedly, population health is viewed as an

Key questions

Recommendations for policy

- Data are primarily needed to inform planning and decision-making, thus the need to strengthen health information systems beyond SGD3 reporting requirements.
- Countries need to embrace a whole government approach to SDG monitoring given the broad and multisectoral nature of the SDG agenda. In this regard, information systems in relevant sectors need to be strengthened to supporting monitoring of health and health-related indicators.
- Countries need to adapt the SDG agenda, prioritise interventions and indicators and develop country-specific targets, taking into consideration global reporting obligations.
- The private sector plays a significant role in health service delivery, and as such, reporting between the public and private sectors needs to be strengthened to ensure comprehensive monitoring of SDG3 targets.
- Existing information systems should be reviewed to broaden scope in line with the SDG agenda monitoring requirements and strengthened to produce reliable data in a timely manner and capacity for data analysis and use built.

intersectoral development issue. Additionally, SDGs put an emphasis on equity—leaving no one behind.

Looking at SDG3, 'Ensure healthy lives and promote well-being for all at all ages', the WHO highlights some of the challenges presented with regard to monitoring given the number of targets and indicators. There are 23 health and health-related targets of which 13 are in SDG3 for health, with 35 indicators, 26 of which are in the health goal.[1] The emphasis on equity calls for a multisectoral approach to improving health with implications for reporting on health-related actions and the generation of disaggregated data.

Action at country level necessitates the development of country-specific frameworks with indicators and targets, taking into consideration global reporting obligations. Among the major considerations is the need for data on a broader set of health and health-related issues, disaggregated data to monitor equity and strong intersectoral collaboration given the importance of multisectoral action as well as monitoring.

Several challenges as well as lessons that can inform country efforts in improving monitoring have been highlighted. Among the challenges is the narrow scope of the available information systems. The narrow scope relates to focus on the public sector, limited attention paid to some aspects of the health system and limitations in survey questionnaires. Additional concerns include weaknesses in existing information systems, lack of capacity for data analysis, inability of available information systems to provide disaggregated data, bias towards quantitative data and irregularity of population-based surveys. There is a multiplicity of data collection systems designed along disease programme and projects, despite the existence of the District Health Information System 2, which can be customised to serve all data requirements.[2] For example, Zambia noted the existence of 16 different information systems, and despite this, all required data for SDG3 monitoring are not collected. Further, these information systems do not serve all the data needs of the Ministry of Health (MoH). Undue emphasis on ensuring measurement is another concern given the pressure to show progress.[3]

On the other hand, strong country leadership, prioritising longer-term country capacity building as opposed to urgent needs for data, a comprehensive approach to strengthening a unified information system as opposed to selective approaches focusing on specific data needs and sustained country support coupled with shared responsibility and accountability are some of the positive lessons countries can pursue.[4 5]

THE NARROW SCOPE OF EXISTING INFORMATION SYSTEMS

Despite the significant use of the private sector by the population to seek services, majority of private health facilities do not provide data routinely to the MoH.[6] As a result, health sector monitoring is not comprehensive to realistically assess progress in the attainment of SDG3 targets and indicators. For example, the use of the private for-profit sector is as high as 39.7% in Uganda[7] and 47% of the poorest quintile in Kenya,[8] yet the private sector in these countries does not provide data to ministries of health. Several scholars cite similar challenges of multiple sources of data outside the public health system with limited information sharing.[9] Acknowledging this fact, De Costa and Diwan emphasised the need for the public sector to play an oversight role over the entire sector and build strong public–private partnerships.[10] This oversight role should also be extended to data sharing and monitoring sector performance. However, ensuring that the private sector abides with the reporting obligations may have cost implications. The provision of reporting tools and training in data management are not cost neutral, and these costs may have to be borne by the government. The narrow scope has also been noted in reference to specific data sources where survey questionnaires are influenced by funding agencies as opposed to realistic information needs. The skewing in the data collected is another concern. In monitoring health sector performance, the balance of indicators across the domains of inputs, outputs, outcomes and impact is important.[11] Data must be collected on the inputs into service delivery, for example, medicines and number of health workers; the processes undertaken to translate inputs into outputs, for example, training of health workers to deliver services better; the outputs, for example, number of patient attended to; the outcomes realised, for example, coverage of services; and the impact attained like reduction in mortality. However, evidence has shown focus on a limited set of indicators and targets[1 3] as well as inadequate attention paid to certain health system building blocks.[10] Strengthening information systems to assess performance of SDG3 targets should not be pursued

at the expense of comprehensive information systems strengthening to assess health sector performance. Boerma *et al* cautioned against this possibility given their findings in the MDG era where readily available data sets centred around MDG-related indicators.[3]

WEAKNESSES IN EXISTING INFORMATION SYSTEMS AND LACK OF CAPACITY FOR DATA ANALYSIS

Available data are not disaggregated enough to monitor equity in line with policy-relevant equity stratifiers. The WHO proposes equity stratifiers along several dimensions, including sex, age, residence, social economic category and minority status.[1] However, in pursuant of equity, stratifies of interest should be country specific, implying that there may be additional parameters of policy relevance. For example, in some countries, access to health services by religious groups is of policy interest.[12] Although population-based surveys are a good sources of some of the equity stratifiers like socioeconomic categories, rural/urban residence and education status, the frequency of these is irregular. Periodicity of population-based surveys is noted to vary between 4 and 15 years. This will not suffice for the SDG era, given the onus of regular monitoring to keep track of progress of indicators. Boerma *et al* cited similar challenges and noted the erratic and inaccessible nature of the surveys conducted by international agencies.[3] Berman *et al*, in their work on MDG count down in 75 priority countries, highlighted limitations related to population-based surveys with reference to periodicity and different recall periods, making causal inferences, cross-country comparisons and linkages between policy adoption and intervention coverage trends difficult.[13] Furthermore, in most cases, sample sizes from population-based surveys are not adequate to generate reliable subnational and special population group estimates.[14] However, large country-wide surveys are costly, and low-income and middle-income countries do not possess adequate resources to conduct more frequent surveys. Additional challenges relate to the inadequate capacity of country statistical units in reference to skills, staffing and required resources, which must be addressed. On the other hand, we need to critically examine the extent to which these equity stratifiers can be accommodated within existing information systems. The envisaged time frame to realise changes given investments made may guide the process of mainstreaming equity stratifiers in the existing information systems. For example, even with the best of investments, equity in access by social economic category cannot be realised in a period of 1 year. This then is best mainstreamed in surveys that take place every 3 years. On the other hand, equity in access by gender can be monitored annually. Furthermore, some of the equity analysis could be in the research domain emphasising the need to strengthen national health research systems, which are currently performing at varying levels in the WHO African Region.[15]

Whether all indicators can be realistically measured is another question. Majority of indicators can however be measured given the fact that these were derived from the 100 WHO core indicators, which were compiled in consultation with member states based on measurement feasibility. Data for one-third (approximately) of the indicators can be collected from civil registration systems, one-third from surveillance and routine systems and the rest from the population-based surveys. On the contrary, for a few new indicators, measurement feasibility needs to be deliberated. For example, how do we measure 'well-being'? Challenges are viewed from two fronts: (1) the contextually appropriate definition of such an indicator and (2) the feasibility of existing information systems to collect relevant information. AbouZahr and Boerma, in the review of health information systems (HIS), highlighted the strong focus on quantitative data.[4] How do countries incorporate 'well-being' in routine data collection instruments? In some contexts, incorporating all relevant indicators in national information systems is unrealistic, and in such cases, prioritisation of indicators and linkages with already existing national health indicators needs to be explored to minimise duplication. Boerma *et al* emphasised the need for strengthening health management information systems to incorporate the measurement of essential SDG-type indicators, specifically on quality of care, safety, client centredness and NCDs.[3]

MULTIPLICITY OF INFORMATION SYSTEMS

Although information systems exist in majority of countries, these are inadequate due to several reasons. There is a lot of data collected by the different stakeholder, which are not available to the MoH due to lack of interoperability of the systems and lack of institutionalised data sharing procedures. Gloyd *et al* documented inconsistencies, numerator–denominator incompatibility, missing and doubtful data regarding the data for the same indicators derived from routine information system and programme-based information systems.[2] Fragmentation of HIS and lack of effective coordination and leadership are known hindrances to timely availability of data to inform planning and decision-making.[16 17] Seitio-Kgokgwe *et al*[5] also drew our attention to similar concerns where the development of the national HIS in Botswana was negatively affected by weak leadership, weak policy and regulatory frameworks.

Given the multisectoral nature of SDGs, some relevant data sources are not managed by the MoH. Information systems relevant to the monitoring of SDGs are managed by several ministries and government agencies creating fragmentation and compromising countries' overall efforts to meet their monitoring commitments. Particularly in the WHO African region, ministries of finance, health, international cooperation, agriculture and planning can all be involved at different levels. Coordination between ministries needs to improve in

order to harmonise and create a whole-of-government approach to monitoring. The weak intersectoral collaboration in health development in general impacts similar collaboration in accessing data. Little success has been realised in institutionalising multisectoral collaboration in health development despite a boost by the social determinants of health[18] and the macroeconomics and health commissions[19] that put forward evidence and strongly advocated for this approach. Highlighted challenges include operation issues like who chairs the multisectoral forum, who takes charge of the multisectoral agenda once agreed and competition for limited resources.[20–22] Other documented challenges include the lack of feedback mechanisms, shared responsibility and incentives to reward collaboration efforts.[21]

UNDUE EMPHASIS ON ENSURING MEASUREMENT OF SDGS

The emphasis on compiling statics was noted in the era of MDGs.[1] On a positive note though, capacity was strengthened to track progress. This notwithstanding, we need to balance investments in strengthening monitoring and implementation to attain SDGs, and in this regard, emphasis would be on using existing information systems. The fear of undue emphasis on monitoring of SDGs should be discussed in light of the need for a holistic approach to strengthening information systems. Data are primarily important in informing planning and resource allocation even beyond the SDG targets and indicators. We need to look at the HIS in a more holistic manner so that we improve health planning in general.

AVAILABLE OPPORTUNITIES

Global health initiatives (GHIs) offer opportunities that can be exploited to strengthen information systems. However, skewed investments in information needs that address GHI-funded programme have been documented.[3] As such, the need for better negotiation by ministries of health to ensure a holistic approach to strengthening information systems is crucial.[23] The health data collaborative (HDC) that seeks to align partners' support towards a consensual country-owned monitoring and evaluation (M&E) framework is another opportunity. There are positive lessons of the HDC from Kenya with realised partner alignment to one M&E plan, greater engagement of national statistical office and improved data quality. Key prerequisites are stated as clear country priorities with stakeholder roles and responsibilities defined, strong country leadership and strengthening existing systems as opposed to creating new ones.

CONCLUSION

Strengthening country capacity to monitor SDGs3 will involve several actions: domestication of the SDG agenda through country-level planning and monitoring frameworks and prioritisation of interventions, indicators and setting country-specific targets. Existing information systems should be reviewed to broaden scope in line with the SDG agenda monitoring requirements and strengthened to produce reliable data in a timely manner and capacity for data analysis and use built. There is a need to embrace a whole government approach in strengthening SDG3 monitoring given the broad and multisectoral approach entailed. The private sector plays a significant role in health service delivery, and as such, reporting between the public and the private sectors needs to be strengthened. We should not lose sight of the fact that data are primarily needed to inform planning and decision-making, thus the emphasis on strengthening HIS beyond SGD3 reporting requirements.

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REFERENCES

1. World Health Organization. *World health statistics 2016: monitoring health for the SDGs, sustainable development goal*. Geneva - Switzerland: World Health Organization, 2016.
2. Gloyd S, Wagenaar BH, Woelk GB, *et al*. Opportunities and challenges in conducting secondary analysis of HIV programmes using data from routine health information systems and personal health information. *J Int AIDS Soc* 2016;19(5 Suppl 4):20847.
3. Boerma T, Eozenou P, Evans D, *et al*. Monitoring progress towards universal health coverage at country and global levels. *PLoS Med* 2014;11:e1001731.
4. AbouZahr C, Boerma T. Health information systems: the foundations of public health. *Bull World Health Organ* 2005;83:578–83.
5. Seitio-Kgokgwe O, Gauld RD, Hill PC, *et al*. Development of the National Health Information Systems in Botswana: pitfalls, prospects and lessons. *Online J Public Health Inform* 2015;7:210.
6. Nabyonga-Orem J, Tumusiime P, Nyoni J, *et al*. Harmonisation and standardisation of health sector and programme reviews and

evaluations—how can they better inform health policy dialogue? *Health Res Policy Syst* 2016;14:87.
7. Konde-Lule J, Gitta SN, Lindfors A, *et al*. Private and public health care in rural areas of Uganda. *BMC Int Health Hum Rights* 2010;10:29–24.
8. Kenya Ministry of Health. *Kenyan Healthcare Sector Opportunities for the Dutch Life Sciences & Health Secto*. Nairobi - Kenya: MoH, 2016.
9. Bhattacharyya S, Berhanu D, Taddesse N, *et al*. District decision-making for health in low-income settings: a case study of the potential of public and private sector data in India and Ethiopia. *Health Policy Plan* 2016;31(Suppl 2):ii25–ii34.
10. De Costa A, Diwan V. 'Where is the public health sector?' Public and private sector healthcare provision in Madhya Pradesh, India. *Health Policy* 2007;84:269–76.
11. WHO. Monitoring evaluation and review of national health policies, strategies and plans - Chapter 9. In. WHO: Geneva Switzerland, 2016.
12. Maguranyanga B. Apostolic religion, health, and utilization of maternal and child health services in Zimbabwe. In. UNICEF: Harare Zimbabwe, 2016.
13. Berman P, Requejo J, Bhutta ZA, *et al*. Countries' progress for women's and children's health in the Millennium Development Goal era: the countdown to 2015 experience. *BMC Public Health* 2016;16.
14. Larmarange J, Bendaud V. HIV estimates at second subnational level from national population-based surveys. *AIDS* 2014;28 Suppl 4:S469–S476.
15. Kirigia JM, Ota MO, Motari M, *et al*. National health research systems in the WHO African Region: current status and the way forward. *Health Res Policy Syst* 2015;13:61.
16. Nyamtema AS. Bridging the gaps in the Health Management Information System in the context of a changing health sector. *BMC Med Inform Decis Mak* 2010;10:36.
17. Garrib A, Stoops N, McKenzie A, *et al*. An evaluation of the District Health Information System in rural South Africa. *S Afr Med J* 2008;98:549–52.
18. World Health Organization Commission on Social Determinants of Health. *Closing the gap in a generation: health equity through action on the social determinants of health*. Geneva-Switzerland: WHO, 2017. http://www.who.int/social_determinants/en (accessed 29 May 2017).
19. World Health Organization. *Improving health outcomes of the poor: the report of Working Group 5 of the Commission on Macroeconomics and Health*. Geneva-Switzerland: WHO, 2002.
20. Collin A, Pettigrew P, Aves S. Exploring leadership in multi-sectoral partnerships. *Leadership* 2007;3:211–30.
21. Fawcett S, Schultz J, Watson-Thompson J, *et al*. Building multisectoral partnerships for population health and health equity. *Prev Chronic Dis* 2010;7:A118.
22. Adeleye OA, Ofili AN. Strengthening intersectoral collaboration for primary health care in developing countries: can the health sector play broader roles? *J Environ Public Health* 2010;2010:1–6.
23. Mwisongo A, Soumare AN, Nabyonga-Orem J. An analytical perspective of global health initiatives in Tanzania and Zambia. *BMC Health Serv Res* 2016;16(Suppl 4):223.