Data, monitoring and follow-up

1. Key messages and recommendations

Since the adoption of Agenda 2030, the need for data and statistics has intensified, with the rapid spread of digital technologies bringing great opportunities as well as challenges. Big data and other innovations can help to strengthen official statistics for the implementation and monitoring of the Sustainable Development Goals (SDGs). However, they come with risks in the absence of internationally accepted standards for data use, regarding, for example, licensing, privacy and security. The evolving data ecosystem around new technologies, data sources and actors is also challenging the traditional role of official statistical systems and can be difficult to integrate. The extensive experience of national statistical offices in working with data should be leveraged to ensure efficient use of data for public good and to maximize the value of data assets in the ecosystem.

Significant changes in the financing for development landscape have spurred demand for data and statistics yet funding remains inadequate. The pace of progress on data frameworks, measurements and collection and, critically, on financing for data and statistics, has not kept pace with demand. With seven years to the deadline for achieving the SDGs, significant SDG data gaps persist. Funding for statistical systems and data ecosystems has also remained flat since 2015 and has fallen since the COVID-19 pandemic. Official development assistance (ODA) for data and statistics was 0.3 per cent in 2020, a fraction of actual needs. Efforts are, however, under way to mobilize finance for data and statistics. The United Nations system has proposed a way forward to consider measures beyond gross domestic product (GDP), towards mainstreaming indicators on well-being, inequality and multidimensional vulnerability.

Urgent action is needed by all stakeholders:

- *The international community should scale up funding for data and statistics.*

- *Countries should prioritize resources towards the development of their national statistical and data systems, including establishing data stewards.*

- *Stakeholders should work together to close the SDG data gaps and develop metrics beyond GDP.*

2. Data frameworks, measurements and collection

2.1 Global indicator framework for the SDGs

The global indicator framework for the SDGs continues to be strengthened. As of 2 November 2022, the global SDG indicator database includes data for 219 of the 231 unique indicators and more than 2.3 million data records (figure IV.1). This improvement has been underpinned by the efforts of Member States and custodian agencies. Most indicators without any data have projected dates or have plans for updates in place. Improving the indicator framework and closing the remaining data gaps will be a focus of the statistical community and the next comprehensive review of the global indicator framework for the SDGs in 2025, for which the Inter-agency Expert Group on SDG Indicators has already started preparations.

Despite progress on SDG reporting, significant data gaps persist. Incomplete geographic coverage, outdated data and lack of disaggregation by vulnerable population groups hinder the monitoring of progress on the SDGs[1] For eight of the 17 SDGs, fewer than half of the 193 countries or areas have globally comparable data (figure IV.2). SDG 3 on health and SDG 7 on energy have the highest data availability, with more than 80 per cent of countries providing at least one datapoint since 2015. In contrast, only about 20 per cent of countries have reported data for SDG 13 on climate action. Out of 32 SDG indicators

requiring disaggregation by sex, only 21 have the latest disaggregated data available in more than 80 per cent of countries providing at least one data point since 2015. For eight indicators, sex-disaggregated data is not available at all. For indicators requiring disaggregation by disability status, reporting is sparser, with only two out of 10 SDG indicators reported.[2] A critical source of disaggregated data for monitoring the SDGs is population data, which is collected through censuses conducted every 10 years. Many countries were in the middle of the 2020 round of census activities when COVID-19 disrupted collection. Out of 49 United Nations Population Fund (UNFPA) programme countries scheduled to conduct census enumeration in 2020, only 13 countries managed to complete the census, and many postponed it to 2021 and 2022. In 2021, only 12 programme countries completed the census enumeration, while 26 out of an expected 48 programme countries completed the census enumeration in 2022. Delays, interruptions and reallocation of funds to other activities may further compromise the quality or result of census projects.

Work is advancing on the new SDG indicator 17.3.1. on "additional financial resources mobilized for developing countries from multiple sources". The indicator is part of SDG target 17.3, which aims to "mobilize additional financial resources for developing countries from multiple sources" and is underpinned by an agreed conceptual framework on South-South cooperation (see chapter III.C). The Organisation for Economic Co-operation and Development (OECD) and the United Nations Conference on Trade and Development (UNCTAD) are the co-custodians of the new indicator and work is under way on the first global reporting of the indicator. Capacity-building activities are also planned. The co-custodians aim to coordinate validated data collection from countries to ensure harmonization and avoid duplication. Reporting of the indicator

began in 2022 from existing sources, such as the OECD Total Official Support for Sustainable Development (see chapter III.C) database and the UNCTAD Foreign Direct Investment database. Data on South-South cooperation will be added gradually.[3]

Figure IV.1
Number of SDG data records and proportion of SDG indicators with data available, 2016–2022
(Millions)

■ SDGs data records

— Percentage of SDG indicators with data (right axis)
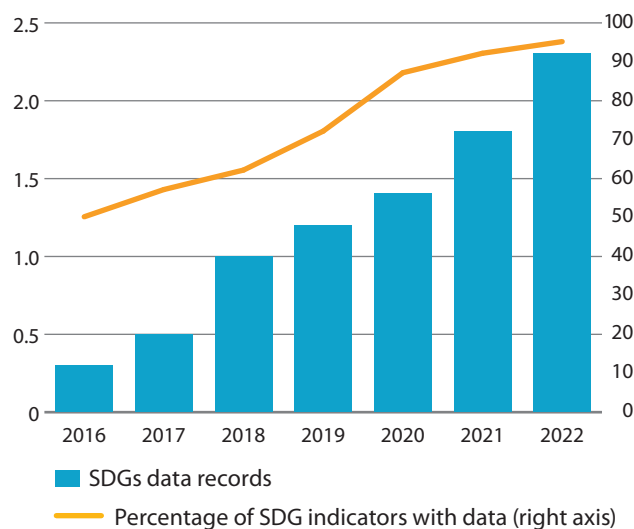
Source: UNSD Global SDG Indicators Data Platform.

Figure IV.2
SDG coverage of country-level data and the average number of years available as of February 2023
(Percentage of countries with available data; average number of years available)

■ Percentage of countries with available data   ○ Average number of years available in median country (right axis)
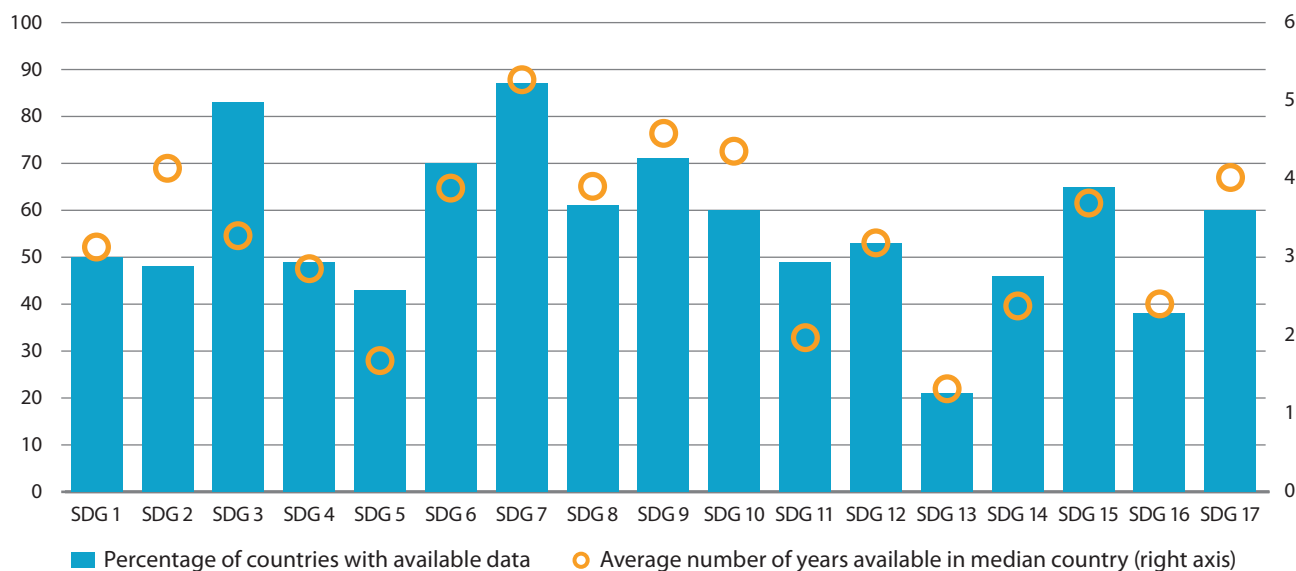
Source: UNSD Global SDG Indicators Data Platform.
Note: Percentage of countries with available data is the weighted average across indicators. Average number of years available is the weighted average of the median country by indicator.

2.2 Gender statistics

Prevailing data gaps hinder progress monitoring on SDG 5 to achieve gender equality. While all 18 indicators of SDG 5 on gender equality can be measured,[4] only 47 per cent of data required to track progress on SDG 5 is currently available.[5] As a result, a global-level assessment is only available for 13 out of 18 SDG 5 indicators. Only three indicators have sufficient data for measuring the pace of progress at the global level. There are also large gender data gaps in other areas,[6] including property rights, women entrepreneurship, recognizing and valuing unpaid care, women in decision-making, conflict and crime, technology, climate and environment, as well as water and energy. UN Women estimates that it will take about 22 years to make all gender-specific SDG data available.[7] A range of agencies have undertaken efforts to make available gender statistics accessible through various data portals (box IV.1).

Gender mainstreaming encourages gender-disaggregated data collection, which can support gender-inclusive policies. As gender-disaggregated data is not collected systematically in all areas of statistics, having a gender perspective across all areas can improve the systematic collection of sex-disaggregated data and statistics. The United Nations Statistical Commission has emphasized the need for national statistical offices to commit to mainstreaming a gender perspective into its work at all levels and stages.[8] As part of these efforts, the Inter-Agency and Expert Group on Gender Statistics has established a new Advisory Group on Mainstreaming a Gender Perspective to develop concrete proposals on gender mainstreaming.[9] This will build on related work in the Statistical Conference of the Americas. Support is also ongoing for gender mainstreaming work at the country level.

Sufficient funding for gender data and statistics is required to fill the gaps, enabling evidence-based policymaking. Funding for both overall national statistics and gender statistics has been stagnant since 2015, with only 13 per cent of countries worldwide dedicating a portion of their budget to gender statistics.[10] In 2020, funding for gender data decreased by 55 per cent over the average level of 2017-2019 (figure IV.3),

corresponding to nearly three times the drop in funding for overall data and statistics.[11] Two thirds of all funding for gender data depends on only five donors,[12] leaving funding for gender statistics unsustainable and unstable without diversification of the donor landscape.

Box IV.1
Data portals for gender statistics

There are several data portals that help to disseminate available gender statistics:

- The **World Bank Gender Data Portal**[a] provides open access to over 900 indicators compiled from officially recognized international sources, including demography, education, health, economic activities, assets, leadership and gender-based violence.

- The **United Nations Statistics Division Gender Data Hub**[b] features the minimum set of gender indicators agreed by the United Nations Statistical Commission as a guide for national production and international compilation of gender statistics.

- The **UN Women Data Hub**[c] features the latest data on 52 gender-specific SDG indicators and the latest analytical resources.

- The **United Nations Population Fund Population Data Portal (PDP)**,[d] contains 13 thematic interactive dashboards, including one on intimate partner violence.
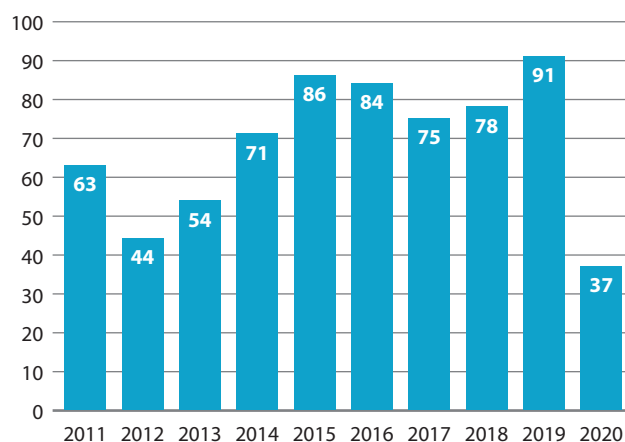
Source: UN/DESA.
a https://genderdata.worldbank.org/. See also specific data on women, business and the law (https://wbl.worldbank.org/en/wbl), and on the living standards measurement study – plus (https://www.worldbank.org/en/programs/lsms/initiatives/lsms-plus).
b https://gender-data-hub-2-undesa.hub.arcgis.com.
c https://data.unwomen.org/.
d https://pdp.unfpa.org.

2.3 Monitoring the economic and financial sector

Following the success of the Group of Twenty (G20) Data Gaps Initiative, efforts towards a new international cooperation initiative continue. The aim of the G20 Data Gaps Initiative was to address data gaps in the financial sector that were exposed by the 2008 world financial and economic crisis. Significant progress was achieved during phases 1 (2009-2015) and 2 (2015-2021) to improve data coverage, timeliness and periodicity. Data gaps have been closed in many areas, including on financial soundness indicators, global systemically important financial institutions, non-bank financial intermediation, derivatives data and securities statistics. This has contributed to better and more detailed assessments of macroprudential and financial stability risks. Advancements under the Data Gaps Initiative have also helped with COVID-19 pandemic responses. In November 2022, the Financial Stability Board Secretariat, the International Monetary Fund (IMF) and the Inter-Agency Group on Economic and Financial Statistics, in consultation with participating economies, announced a high-level work plan for a new Data Gaps Initiative. It includes 14 recommendations designed to address priority policy needs for: (i) climate change; (ii) distribution of household income and wealth; (iii) financial technology (fintech) and financial inclusion; and (iv) access

Figure IV.3
Funding for gender data and statistics
(Millions of United States dollars)

Source: PARIS21. 2022. "Partner Report on Support to Statistics 2022".

to private sources of data and administrative data, and data-sharing to improve the timeliness and granularity of official statistics.[13] The plan will be submitted to G20 finance ministers and central bank governors later in 2023, with its recommendations expected to be implemented within five years after the launch.[14]

The number of countries reporting to the World Bank Debt Reporting System (DRS) has increased. The DRS is the main source of the World Bank's external debt data statistics database. The past decade has seen a marked improvement in the coverage, completeness and accuracy of DRS reporting. Reporting on private, non-guaranteed debt is also rising (figure IV.4), as countries' debt portfolios have evolved. These improvements have been spurred by concerted efforts to strengthen and enhance countries' debt recording and reporting to better understand rising debt vulnerabilities (see chapter III.E). It also reflects implementation of reforms to strengthen debt management capacity.[15] In contrast, there are significant data gaps on borrowing by state-owned enterprises (SOEs), particularly SOE borrowing without a government guarantee. This is usually due to discrepancies between the country's definition of public debt and DRS reporting standards, the absence of systems to collect data at the national level, and the limited authority of the national debt office.[16]

Figure IV.4
Countries that report public and publicly guaranteed and private, non-guaranteed year-end transaction data to the DRS, 2010–2021
(Percentage)

Public and publicly guaranteed debt
Private non-guaranteed debt
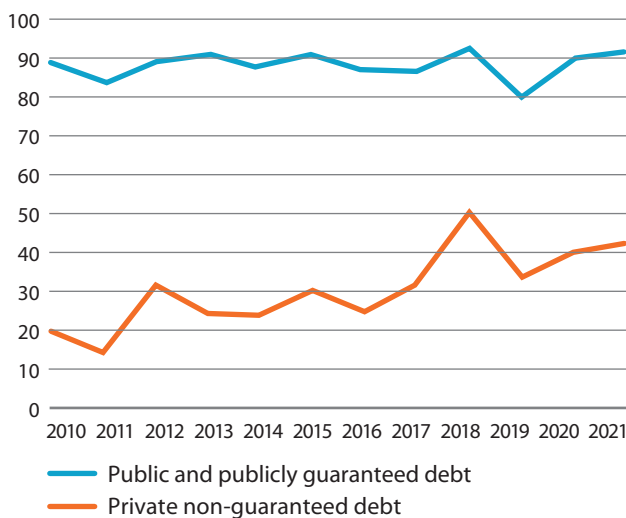
Source: World Bank. 2022. *International Debt Report 2022 – Updated International Debt Statistics.*
Note: The dip in 2019 reflects the reporting challenges faced by countries during the COVID-19 pandemic lockdowns. The list of reporting countries is based on year-end 2021 data.

Although data availability on the contribution of the private sector to achieving the SDGs has increased, the quality and comparability of data needs to improve. The 2030 Agenda highlights the role of enterprise reporting as a primary source of information on the

contribution of the private sector to the achievement of the SDGs. SDG target 12.6 encourages companies to adopt sustainable practices and to integrate sustainability information into their reporting cycle. In 2021, more than 90 per cent of the S&P 500 companies published a sustainability report, up from only 20 per cent a decade ago.[17] However, the quality of data and information provided through sustainability reports needs to be improved, and chapter III.B presents concrete actions and recommendations for governments to address this issue.

To measure the private sector's contribution to sustainability, corporate sustainability disclosures should be linked to the SDGs. Four out of five companies assessed in a recent study noted commitments to the SDGs, yet fewer than half set measurable targets related to these Goals.[18] Another study found that only 0.2 per cent of companies were strongly aligned with the SDGs.[19] The Global Investor for Sustainable Development Alliance works towards the global convergence of corporate sustainability-related disclosures based on a common reporting baseline.[20]

For sustainability-related information from the private sector to be useful, data also needs to be comparable across reporting entities over time. Efforts are under way to strengthen comparability of private sector data on sustainability measures. For example, the World Benchmarking Alliance is developing a series of freely accessible benchmarks assessing 2,000 of the world's most influential companies, ranking and measuring them on their contributions to the SDGs.

2.4 Measures of sustainable development beyond GDP

The United Nations system proposes a way forward to consider measures beyond GDP. GDP is a long-standing measure of economic prosperity, with GDP per capita often used to broadly measure average living standards or economic well-being in different countries. However, there is increasing concern over the limitations and inadequacy of GDP, particularly as it does not encompass dimensions of well-being, distribution, economic sustainability (such as increasing indebtedness) and environmental sustainability. In his 2021 report, *Our Common Agenda,* the United Nations Secretary-General called for new measures to complement GDP.[21] In response, the United Nations system, through the High-level Committee on Programmes (HLCP) Core Group on Beyond GDP, has proposed a framework for beyond GDP metrics as well as a political and technical process to move it forward (box IV.2). The HLCP recognizes that broad Member State agreement is needed to move the beyond GDP agenda, highlighting the 2024 Summit of the Future as an opportunity to launch a high-level political process, spearheaded by the United Nations Secretary-General, to discuss the rationale and outline a process to go beyond GDP, including the setting of concrete goals and targets.[22]

Work advances on the development of a Multidimensional Vulnerability Index (MVI). In February 2022, a High-Level Panel was appointed to develop an MVI. In its interim report, the Panel proposed a framework for the development of an MVI (figure IV.5), comprising two components: structural vulnerability, "the risk of a country's sustainable development being hindered by recurrent adverse exogenous shocks and stressors," and structural resilience, "the capacity of a country to dampen the impact of and quickly recover from shocks and to adapt flexibly in response to stressors".[23] Associated responses to reduce a country's structural

vulnerabilities and improve its structural resilience over time would depend on the source of the vulnerability to be addressed i.e., economic, social or environmental. The Panel also proposed the inclusion of national vulnerability-resilience profiles, which will represent the operational part of the MVI framework. Data availability is key to the design of the MVI, and the selection of indicators will depend on the quality of available data and the relevance of the indicator. To ensure universality, the MVI will include all developing countries. The Panel's final report will outline the selected indicators, their rationale and methodology for weighting and aggregation.[24]

Box IV.2
United Nations system proposals for moving the beyond GDP agenda

Foundational dimensions of a framework for beyond GDP

The framework consists of three outcome elements and three process elements. The three outcomes are derived from the dimensions identified in the Brundtland Report that was prepared for discussion by the United Nations General Assembly in 1987 and later informed the Rio+20 Conference and the 2030 Agenda. The framework defines sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their needs". The report also considers that sustainable development is essentially about distributional justice. The framework, thus, proposes three outcome elements:

(i) "Well-being and agency" to focus on well-being now;

(ii) "Respect for life and the planet" to ensure possibilities for life and well-being in the future; and

(iii) "Reduced inequalities and greater solidarity" towards a more equal distribution of well-being.

Measures or indicators for each dimension may include flows as well as stocks and, potentially, composite indicators. While flow measures focus more on current changes, e.g., well-being now, stock measures are particularly important for assessing sustainability, i.e., possibilities for future well-being, and metrics on inequalities require detailed information that enable analysis of distributions.

The **three process elements** reflect the 2030 Agenda and the *Our Common Agenda* report with a particular focus on factors that enable sustained progress towards the three outcomes:

(i) "From vulnerability to resilience" focuses on human interaction with the natural and built environment to strengthen preparedness and ensure the conditions for well-being given multiple risks;

(ii) "Participatory governance and stronger institutions" steer societies towards the outcomes ensuring equal and safe societal conditions empowering everyone to contribute; and

(iii) "Innovative and ethical economies" serve people and societies by fostering innovation to find solutions to their challenges with responsible and ethical actions that expand the capacity to coordinate and deliver positive outcomes.

Proposal for a high-level political process to move beyond GDP

1. **Informal consultations, 2022-2023:** Discuss the rationale for progress beyond GDP, identify opportunities and challenges in progress towards better well-being, sustainability for future generations and inclusiveness, i.e., well-being for all.

2. **Consideration and preparation before and at the Summit of the Future in 2024**: Discuss how to move beyond GDP, placing true value on the environment and focusing on human progress and well-being to achieve the 2030 Agenda. Aim at a high ambition for the outcomes of the Summit of the Future, build rapport.

3. **Commit, at the Summit of the Future in 2024:** Make firm commitments to change the policy paradigm to ensure progress towards the vision for well-being for everyone and everywhere (equality), now and later (sustainability).

4. **Set targets, follow-up to the Summit of the Future in 2024:** Set a common vision and concrete goals for a future policy framework to move beyond GDP.

5. **Empower, 2024-2025:** Engage national, regional and international authorities and stakeholders to advance the agenda within their current and new mandates.

6. **Lead and steer, annual recap from 2025 onwards:** Monitor progress with metrics of beyond GDP, engage, influence and ensure corrective or enforcing action to achieve the common vision for the future of people and the planet.

7. **Reprioritize, every three to five years:** Ensure a continuous discussion of priorities, adjust goals and targets of the beyond GDP framework and take corrective action.

The technical reforms needed to move forward include: (i) an ambitious System of National Accounts update and extension; (ii) development of new methods and metrics in line with the proposed framework and its six themes and reflecting the outcomes of the Summit of the Future; (iii) a review of the uses of GDP and beyond GDP metrics within the multilateral system; and (iv) a United Nations data agenda for beyond GDP that steps up statistical capacity development to enable country-owned reporting of progress beyond GDP. In parallel, the United Nations could launch a global challenge to contribute to the development of new metrics to complement GDP, aiming to create global excitement and engagement in contributing to beyond GDP through a participatory process.

Source: High-Level Committee on Programmes (HLCP) Core Group on Beyond GDP. "Valuing What Counts – United Nations System-Wide Contribution on Progress Beyond Gross Domestic Product (GDP)". United Nations System Chief Executive Board for Coordination, 17 August 2022.

Figure IV.5
The Multidimensional Vulnerability Index framework
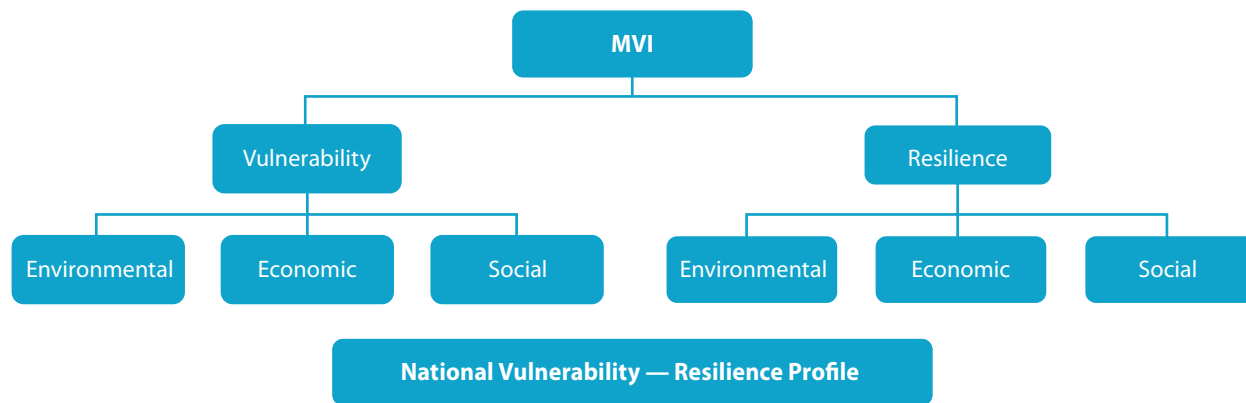
Source: High Level Panel on the Development of a Multidimensional Vulnerability Index. *Interim Report.* United Nations, August 2022.

2.5 Sustainable industrialization statistics

Increased availability of industrial statistics can better inform sustainable industrial policy. Industrial statistics provide information on productivity, industrial performance and the degree of an economy's industrialization (see box IV.3).[25] Many governments are constrained by the lack of basic data when formulating national industrial policies. Lack of industry data for financial decision-making can also increase perceived risks and hinder private sector investments in developing countries. The data needed for industrial statistics is typically collected through economic censuses and industry surveys. A proper sampling plan and an adequate survey period can ensure good representation of and disaggregation by geographical areas, industries and their activities.[26] Amending enterprise size thresholds can also capture small-scale industrial enterprises that play an important role in many developing countries in their path towards sustainable industrialization. However, censuses and surveys are done

periodically and can be time-consuming. Exploring alternative data sources, including administrative sources and big data, can help to fill in data gaps.[27]

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Box IV.3
Overview of industrial statistics

Industrial statistics refer to data on a broad group of productive activities comprising mining, manufacturing, electricity, gas, water supply and other utility industries.[a] An industry is defined as a category of economic activity catalogued in the International Standard Industrial Classification of All Economic Activities, which is the international reference classification of productive activities.[b] The International Recommendations for Industrial Statistics 2008 provides a comprehensive methodological framework for the collection and reporting of industrial statistics in all countries, irrespective of the level of development of their statistical systems.

The Index of Industrial Production has historically been one of the most frequently used indicators.[c] The Index, reflecting temporal changes in the value-added for individual industries, has a strong relationship with the performance of an economy as a whole and provides the information needed for industrial policy formulation.[d] The International Recommendations for the Index of Industrial Production 2010 outlines the methodological standards for the compilation of index numbers of industrial production.[e]

Global responsibility for the annual collection of general industrial statistics lies with the United Nations Industrial Development Organization (UNIDO), which is also the custodian agency for six industry-related indicators under SDG 9 on "industry, innovation and infrastructure". The UNIDO online data portal contains industrial statistics for more than 110 countries.[f]

Source: UN/DESA.
a United Nations Statistics Division. 2010. "International Recommendations for the Index of Industrial Production 2010".
b United Nations Statistics Division. 2008. "International Recommendations for Industrial Statistics 2008".
c United Nations Statistics Division. 2010. "International Recommendations for the Index of Industrial Production 2010".
d UNIDO. n.d. "Industrial Statistics".
e United Nations Statistics Division. 2022. "Standards and Methods – Industrial Production Index".
f https://stat.unido.org/.

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3. Financing for data and statistics

Funding for data and statistics needs urgent attention. Global data ecosystems need an estimated $5.6 billion per year to achieve the goals of the 2017 Cape Town Global Action Plan for Sustainable Development Data.[28] An analysis showed that for every $1 invested, data has delivered an average economic return of $32, demonstrating the potential of data and statistics.[29] Yet, existing domestic funding currently meets less than 40 per cent of the needs of developing economies.[30] Only half of countries fully fund their national statistical plans, while only five donors provide around two-thirds of funding.[31] In 2020, funding for data and statistics

fell by nearly 16 per cent to $542 million, a record decline since 2015 (figure IV.6),[32] and accounting for only 0.3 per cent of total ODA. The pandemic partly accounts for the decrease, but the drop also reflects the challenge in mainstreaming data activities, the limited pool of donors and the low strategic priority accorded to data and statistics that has persisted for decades.[33] Even prior to the pandemic, funding for data and statistics was only half of the amount needed to produce sufficient data for SDG reporting.[34] The pandemic has also increased data demand, with the latest United Nations-World Bank survey on the impact of COVID-19 on national statistical offices indicating that in two thirds of low- and lower-middle-income countries, statistical agencies lack sufficient resources to meet the demands for data created by the pandemic.[35]

Figure IV.6
Funding for data and statistics
(Millions of United States dollars)
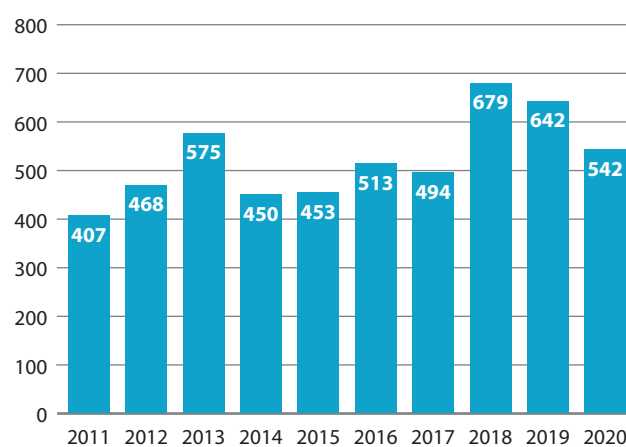
Source: PARIS21. 2022. "Partner Report on Support to Statistics 2022".

Efforts are under way to strengthen coordination and mobilize finance for data and statistics. In 2022, the World Bank and the United Nations launched a "Data With Purpose" campaign to scale up donor and partner coordination and funding to support national data and statistics priorities (box IV.4). The campaign aims to jointly mobilize at least $500 million through the Global Data Facility (GDF) and Complex Risk Analytics Fund (CRAF'd) to meet country demand.[36] The GDF, part of a new, innovative financing architecture, is working to coordinate broad donor support to address the data priorities of low- and middle-income countries, including: modernizing data and statistical systems; strengthening human capital for data production, analytics, use and dissemination; and supporting and expanding institutional and policy arrangements for data and statistics to support economic, social and sustainable development. It is complemented by the Bern Network Clearing House for Development Data, a multi-stakeholder initiative designed to help increase transparency and the efficiency of international financial support for data activities. Launched by the United Nations in 2021, CRAF'd is a multilateral financing instrument to support a strong data ecosystem and expand shared capabilities to better anticipate, prevent and respond to complex risks in conflict- and crisis-affected settings. Guided by its Statistical Performance Indicator profiles,[37] the World Bank is scaling up concessional lending to

low- and middle-income countries to help close core data gaps, including in household surveys, enterprise surveys, agricultural data, price data and administrative data. World Bank lending operations for data and statistics in the pipeline for 2023 so far include commitments of $1.1 billion for International Development Association countries and $0.2 billion for International Bank for Reconstruction and Development countries.

Box IV.4
"Data with Purpose" campaign

The "Data with Purpose" campaign calls on all stakeholders to revitalize support for data and statistics, including supporting integrated data ecosystems: (i) **bilateral and philanthropic donors** to allocate a minimum of 0.8 per cent of their annual investment to data ecosystems through CRAF'd and GDF, as well as increase the transparency of their funding; (ii) **low-income country governments** to allocate 0.5 per cent and **middle-income countries** 0.1 per cent of their annual spending towards data ecosystems; (iii) **the private sector** to be a core partner in establishing and utilizing data ecosystems; and (iv) **all ecosystem participants** to collaboratively drive the agenda forward.

Source: United Nations and World Bank. 2022. *Investment Case: Multiplying Progress through Data Ecosystems.* Data with Purpose Publication.

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4. Accessibility, discoverability and innovation

A strong data ecosystem and improved interoperability can enhance policy design and decision-making. A strong data ecosystem (see *2022 Financing for Sustainable Development Report*) should support the application of new, innovative tools to integrate data from all relevant sources. Data is increasingly used for "immediate action" to provide decision-makers with information needed to assess a current situation, develop solutions and monitor progress. Advanced and innovative nowcasting, forecasting and early warning systems are critical elements to be integrated through improved interoperability. Official data from national surveys and censuses remains a fundamental source for most policy-relevant predictive and simulation models. In contrast, administrative data is underexploited, partly due to widespread quality issues but also because of siloed systems and obstacles to sharing. Geospatial data is timely data with extensive geographic coverage and has the potential to integrate various types of data. Private intent data or "big data" offers immediacy and fine disaggregation but has limitations on its use for development purposes.[38] The lack of internationally accepted standards for integrating data as well as concerns about licensing, privacy and security, hinder data-sharing. Furthermore, the costs of data integration rise with the increasing number of disaggregated and scattered data sources administrated by different stakeholders with varying levels of technical capacity. There are also challenges with outdated technical infrastructure and skills as well as limited government capacity and weak data governance policies. Investments in strengthening data ecosystems and enhancing the interoperability of data can help in the integration of diverse sources (see box IV.5).

Box IV.5
Standards for the digitalization of multimodal trade and transport data exchanges

The United Nations Economic Commission for Europe (UNECE) and its subsidiary body, the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT), developed a set of standards for the digitalization of multimodal trade and transport data exchanges to enable the fast and paperless transmission of trade data across different modes of transport and ensure its international acceptance. This helps with harmonizing standards on the digitalization of trade-related cargo shipment documentation, capturing data exchange structures for maritime, inland water, air, road and rail cargo movements. These standards for digital data-sharing support the seamless flow of information, which facilitates trade and transport in the European Union, notably in the areas covered by the European Union's single window and electronic freight information regulations.

Source: UNECE.

The establishment of data stewards can help to promote accessibility, interoperability and governance. A data steward helps to address issues related to the governance, management, access, and equitable and inclusive use of data for public benefit in a systematic, sustainable and responsible way. Accordingly, the United Nations Statistical Commission and the UNECE Conference of European Statisticians are working towards the development of a common understanding of the roles of a data steward and possible models for its implementation within different national data ecosystems.[39] With special consideration given to the role of the national statistical office, a data steward should promote data quality, data interoperability, open data and sharing of data among public and/or private sector organizations. Data stewardship strengthens public trust in official statistics and data management across the public sector and is necessary for maximizing the value of data assets. National statistical offices have inherent and unique expertise to lead data stewardship in the national statistical system and to take on data stewardship responsibilities across the national data ecosystem. A task team under the Committee of Experts on Big Data and Data Science working on privacy-enhancing technologies, as well as a United Nations Privacy-enhancing Technologies Lab, have been established to resolve privacy and confidentiality issues involving innovative data sources.

More attention is needed on the usability, discoverability and accessibility of data. International assistance provided to statistics and data systems in low-income countries has largely focused on the production of data. Less attention has been paid to enabling and promoting access to and use of data. Datasets of multiple sources and types remain locked and/or underexploited due to issues of usability, discoverability and accessibility. There is considerable underinvestment in data tools and processes—from data collection to use. Improving access to and the use of data requires improvement in many areas, such as convenience (for example, formats and access mode), visibility, discoverability, usability and accessibility of data. This means that data producers need to improve their documentation, packaging and publishing of data so that data users

can find, access, analyse and use available sources. The United Nations Statistics Division has developed an e-learning course to help improve user engagement.[40]

The high costs of innovative data methods and limited capacity hinder application in poorer countries. The official use of innovative big data and advanced analytics in policymaking demand new capacity, skills and frameworks from governments to assess and audit data quality. New tools and standards must be developed to document the production process to ensure transparency and accountability. Dissemination mechanisms need to be updated to allow access to and use of data collected through new technologies. The high cost of acquiring datasets, like high-resolution satellite imagery, can be challenging for governments, in particular LDCs. The information technology cost, such as cloud or on-premises infrastructure, for the storage and analysis of large datasets may also be a barrier for poorly funded agencies.

Initiatives to guide and promote the use of big data and data science support innovations in the use of data. Innovative data methods and sources can support the generation of statistics in various areas, transforming the production of official statistics and enabling the provision of almost instant information on phenomena that were difficult to capture before. The United Nations Expert Group on Big Data and Data Science for Official Statistics has issued methodological guidelines and recommendations on the use of mobile phone data, earth observation data, data from automated identification systems of vessels, transaction data and web-scrapped data.[41] In 2020 and 2021, regional hubs for big data were established in Brazil, China, Rwanda and the United Arab Emirates to assist national statistical offices in building data science skills and incorporating new skills in their workstreams for statistical production. The Expert Group also established a sector hub on Artificial Intelligence for Environment and Sustainability for the System of Environmental-Economic Accounting, which is operated by the Basque Centre for Climate Change in Spain and specializes in sustainability and environmental issues. The Data for Now initiative also helps countries and partners to increase the use of innovative data sources, methods and approaches.[42]

National statistical offices can play a central role in encouraging open data. Open data enhances information transparency, access and use of public sector data.[43] Access to data and metadata can be accelerated when data is provided in a machine-readable format, allows bulk download or is stored in application programming interfaces.[44] This requires sufficient resources and technical capacity to launch and maintain open data platforms. Data security and privacy protection measures must also accompany the use of open data. For example, datasets built on microdata across sectors (e.g., healthcare, education, transportation, criminal justice, property registration/housing and voter registration data) contain private individual records that need to be safeguarded. The challenge of open data initiatives is to balance privacy protection with data accessibility. To ensure this balance, national statistical offices should play a central role in the fast-changing data ecosystem and open data value chain. They can help with standard-setting and regulations as well as improving data literacy to encourage the use of open data.

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