



A ROAD
MAP FOR A
COUNTRY-LED
DATA
REVOLUTION
PARIS21
[INTERACTIVE](#)

Published with the approval of the PARIS21 Board.

This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

© OECD 2015

ISBN 978-92-64-23468-0 (print)

ISBN 978-92-64-23470-3 (PDF)

Also available in:

French: Feuille de route pour une révolution des données menée par les pays

Spanish: Guía para una revolución de datos dirigida por los países

Portuguese: Um roteiro para uma revolução de dados liderada pelos países



110100110101
010101010101
011000010101
010100010101
010101010101
111101010101
010100
010000001010
100010100010
101010101001
0101010111
010101010101
010101011000
010101010100
010101010101
010101111101
0101010
010000010000
0010101000

ACKNOWLEDGEMENTS

This report was prepared by the Secretariat of the Partnership in Statistics for Development in the 21st Century (PARIS21) with the financial support of the Bill & Melinda Gates Foundation. The report was produced in close collaboration with and with the approval of the PARIS21 Board and Executive Committee.

The report was produced by the Informing a Data Revolution (IDR) project team managed by Trevor Fletcher under the guidance of Johannes Jütting (PARIS21). Drafting was carried out under the leadership of Graham Eele (PARIS21 consultant) with the assistance of Geoffrey Greenwell, Thilo Klein and Till Zbiranski (PARIS21) and Brian Keeley (OECD).

Drafting of the associated background papers was carried out by Shuang Chen (PARIS21), Enrico Giovannini (LUISS Guido Carli University, Rome), Matjaž Jug (PARIS21 consultant); Florian Krätke, Jan Vanheukelom and Bruce Byiers (European Centre for Development Policy Management) and Jeffery I. Round (University of Warwick).

Officials from national statistics offices provided invaluable insights by completing the cross-country survey and during meetings and country workshops organised in Bangladesh, Burundi, Cabo Verde, Colombia, the Democratic Republic of Congo, the Philippines and Trinidad and Tobago.

The IDR Technical Review Group coordinated and managed the quality control process of the different outputs produced by the IDR project. This group consisted of Jose Albert (Philippines Statistics Authority), Ricardo Fuentes-Nieva (Oxfam), Dorota Pancsyk (Eurostat), Amanda Glassman (Centre for Global Development), Neil Jackson (Department for International Development, UK), Stephan Klasen (University of Göttingen), Emmanuel Letouzé (Data-Pop), Claire Melamed and Emma Samman (Overseas Development Institute, UK), and Pronab Sen (University of North Carolina).

The report also benefited from comments from the following external reviewers: Shaida Baidee (Open Data Watch), Tullio Buccellato (Ernst and Young), Grant James Cameron and Haishan Fu (World Bank), James Denman (Department for Communities and Local Government, UK), Pilar García Velázquez (Instituto Nacional de Estadística y Geografía, Mexico), Patrick Gerland (United Nations Population Division), David J. Hand (Imperial College, London), Eric Hermouet (Economic and Social Commission for Asia and the Pacific), Claudia Junker (Eurostat), Pablo Tactuk (Oficina Nacional de Estadística, Dominican Republic), Gemma Van Halderen (Australian Bureau of Statistics), Mauricio Perfetti (Departamento Administrativo Nacional de Estadística, Colombia), Matthew Powell (Oxford Policy Management), C. S. Roy (Bangladesh Bureau of Statistics), members of the Royal Statistical Society, Simon Scott (Development Co-operation Directorate, OECD) and Carlo Vaccari (L'Istituto Nazionale di Statistica). Comments were also gratefully received from Shelton Kanyanda, El-Iza Mohamedou, Rudolphe Petras, Leslie Rae, Mahesh Subedi, Millicent Gay Tejada and Koffi Zougbede (PARIS21).

Publication and production of the report was coordinated by Sala Patterson (PARIS21 consultant) and Guadalupe de las Casas and Yvonne Ozoux (PARIS21). The report was designed by Nicholas Dehaney of Spicegrove Creative.

Cover photo supplied by: Dipanker Dutta (cc)





FOREWORD

The Road Map for a Country-led Data Revolution was produced by the Informing a Data Revolution (IDR) project, which was launched by PARIS21 in 2014 and financed by a grant from the Bill & Melinda Gates Foundation. The project aims to help ensure the data revolution serves the post-2015 development agenda. Its focus is on National Statistical Systems (NSS) in developing countries. These are crucial to generating the data needed to promote development and reduce poverty and to monitor international development goals.

As well as this report, the IDR project has a number of other components, including the following:

- Country studies: A study of statistical systems in 27 countries and in-depth studies of 7 countries.
- Innovations Inventory: Inventories of innovative solutions that can help fill data gaps, reduce costs and improve efficiency.
- IDR Metabase: A database on the organisation, management and performance of national statistical systems to provide a baseline and a means for monitoring progress over time

For more on the methodology used to create this report, see Annex - Methodology.

<http://datarevolution.paris21.org/>



ACRONYMS & ABBREVIATIONS



BBS	Bangladesh Bureau of Statistics	INS	National Statistics Institute (DR Congo)
CRESS	Country Report on Support to Statistics	NSDS	National Strategies for the Development of Statistics
CRVS	Civil Registration and Vital Statistics	NSO	National Statistical Office
CSO	Central Statistical Office (Trinidad and Tobago)	NSS	National Statistical System
DANE	National Administrative Department of Statistics (Colombia)	ODA	Official Development Assistance
FPOS	Fundamental Principles of Official Statistics	OECD	Organization for Economic Co-operation and Development
IDA	International Development Association	PARIS21	Partnership in Statistics for Development in the 21st Century
IDR	Informing a Data Revolution	PRESS	Partner Report on Support to Statistics
IEAG	Independent Expert Advisory Group	PSA	Philippines Statistical Authority
IHSN	International Household Survey Network	SDGs	Sustainable Development Goals
INE	National Statistical Institute (Cabo Verde)	UNICEF	United Nations Children's Fund





CONTENTS

Executive Summary	08
Introduction: Today's reality, tomorrow's vision	12
1. The opportunities and the challenges	14
1.1. Defining the data revolution	16
1.2. One hundred and thirty-nine data revolutions	16
2. The four pillars of the road map	18
2.1. Capacity and resources	22
2.1.1. Actions to establish the baseline and harness quick wins	22
2.1.2. Actions for the medium and long term	22
2.2. Principles and standards	24
2.2.1. Actions to establish the baseline and harness quick wins	24
2.2.2. Actions for the medium and long term	25
2.3. Technology, innovation and analysis	28
2.3.1. Actions to establish the baseline and harness quick wins	28
2.3.2. Actions for the medium to long term	28
2.4. Governance and leadership	30



2.4.1.	Actions to establish the baseline and harness quick wins	30
2.4.2.	Actions for the medium to long term	30
<u>3.</u>	<u>Implementation</u>	<u>32</u>
3.1	Building partnerships	33
3.2.	Financing the data revolution	34
3.3.	New ways of funding the data revolution	36
3.4.	Monitoring progress	36
<u>4.</u>	<u>Data in 2030 – a vision for producers and users</u>	<u>38</u>
<u>Annex – Methodology</u>		<u>43</u>
<u>References</u>		<u>44</u>
<u>Country studies</u>		<u>46</u>
<u>The road map</u>		<u>48</u>



EXECUTIVE SUMMARY

1. The opportunities and challenges

At the heart of the data revolution is an explosion in the volume of data matched by a widespread and growing demand for data. But the data revolution is about more than supply and demand. If it is to be meaningful, it must bridge global data inequalities. It must also enable countries and citizens to monitor development progress, hold leaders accountable and promote sustainable development.

How can this be achieved? It is essential to use existing resources and institutions. For this reason, National Statistical Offices (NSOs) will be at the core of the data revolution in developing countries. However, it is clear that many are not currently ready to assume this role. Understanding the problems and

constraints affecting national statistical systems and identifying what is needed to make them work more effectively will be at the heart of the data revolution.

2 The four pillars of the Road Map

Drawing on information collected and analysed as part of the Informing a Data Revolution project, this Road Map sets out a broad programme of actions to help developing countries meet these statistical challenges. Key to much of the discussion in this report are three "big ideas":

- **Increased funding:** This report calls for official development assistance (ODA) for statistics to rise from around 0.5% of ODA at present to around 1%.




In all this, countries are key. Top-down initiatives rarely work. Instead, success comes when countries set their own priorities, goals and strategies. The well-established system of National Strategies for the Development of Statistics (NSDSs) is thus fundamental to an effective and sustained data revolution in developing countries.

Principles and standards: One of the main reasons for placing national statistical systems at the heart of a country-led data revolution is that they already have a set of core principles for managing data and a process to establish and promote standards for different aspects of data work. If the data revolution is to be effective, these principles and standards must be applied as widely as possible.

Overall, there are three main areas of action: Countries should adopt and use key principles, a process that could be promoted through the data

compact; the right of users to access data should be promoted; and key technical standards should be promoted and their adoption actively monitored. **Technology, innovation and analysis:** New technologies and other innovations will play a crucial role in the data revolution. The Innovations Inventory developed as part of the IDR project demonstrates what can be done to help overcome widespread and often acute issues with technology and infrastructure in developing countries.

A major concern for the data revolution will be identifying the innovations that work best for developing countries. Given the lack of resources in many of these countries, much of the necessary research and development will happen at the regional or international level. But it will need to take better account of countries' needs and concerns than has happened in the past.



ONE OF THE MAIN REASONS FOR PLACING NATIONAL STATISTICAL SYSTEMS AT THE HEART OF A COUNTRY-LED DATA REVOLUTION IS THAT THEY ALREADY HAVE A SET OF CORE PRINCIPLES FOR MANAGING DATA

Governance and leadership: Evidence compiled in the course of the IDR project indicates that improvements will be needed at two levels. First, within countries, to strengthen coordination between agencies and to enhance the leadership role of national statistical agencies. Second, at the regional and international levels, where the voice of developing countries needs to be heard and where countries should be encouraged and supported to play a more prominent role in international coordination.

3. Implementation

Turning the data revolution into a reality will require action across many fronts. In addition to strengthening existing partnerships, greater collaboration will be needed, both internationally and at the regional and country levels. Partnerships will also have to spread their net far beyond the traditional statistical community.

Increased funding will be needed from domestic and commercial sources and from the international community. For the short term, funding for statistics needs to be increased from current commitments of between US\$300 million and 500 million to between US\$1 billion and 1.25 billion by 2020. This funding should be seen not as a cost but as an investment that will yield both cost savings and better data over the long run. New forms of funding will also be needed, such as trust funds and challenge funds.

Proper monitoring, drawing on the IDR project's Metabase and the proposed annual Data for Sustainable Development Report, will be essential to identify where progress is being made and where countries are falling behind.



INTRODUCTION

TODAY'S REALITY, TOMORROW'S VISION

A statistical office in a developing country was carrying out a nationwide survey to set a new national poverty line. Its computer "system" consisted of just a single machine, where all the data had to be edited. Files had to be saved on USB keys and transferred to this computer. Back-ups were made on a USB and taken offsite whenever anyone remembered.

Two months in to the project, the electricity was cut off. The statistics office couldn't pay its bill. To keep the work going, a deal was struck with a neighbour to string an extension cord from his home to the office. That provided power for the computer and a desk light. There was no air-conditioning. When it rained, water dripped on to the piles of questionnaires stacked around the dark office.

Two months later, the neighbour unplugged the cable and threw it over the fence. No one had paid him for his power. The statistics office scraped together enough to buy diesel for an old generator. To everyone's surprise, it wheezed into life. Three days later, it rattled to a halt. The data editing was

finally finished on a consultant's computer. Three national staff looked on as their country's poverty line was finalized on the bed of a consultant in a hotel room...

THIS IS A TRUE STORY.

Strapped for cash, reliant on ancient technology, short of qualified staff and housed in cramped offices – the state of national statistical offices in some (although certainly not all) developing countries. If the data revolution is to mean anything it must mean changing that reality. For development priorities to be identified and for progress to be measured, national statistical systems must have the resources to deliver the data that users need.

TO MAKE THAT HAPPEN BY 2030...

Capacity building must support national statistical agencies to become centres of excellence and support users with the resources they need to make use of statistical material.



A set of core principles for managing data and a process to establish and promote standards for different aspects of data work must be applied as widely as possible.

Countries must be supported, both at the regional and international levels, to identify promising technologies and innovations and make best use of them.

Change must come in governance and leadership to enhance the leadership role of national statistical agencies and to ensure countries play a greater role in international coordination.

At the end of this report, a vision is laid out for what a strengthened, effective national statistical system could look like by 2030. To get from here to there, this report first sets out a Road Map for a Country-led Data Revolution.

STRAPPED FOR
CASH, RELIANT
ON ANCIENT
TECHNOLOGY,
SHORT OF
QUALIFIED STAFF
AND HOUSED IN
CRAMPED
OFFICES – THE
STATE OF
NATIONAL
STATISTICAL
OFFICES



ONE: THE
OPPORTUNITIES
AND THE
CHALLENGES

0100010101 101010010101011

1.1. DEFINING THE DATA REVOLUTION

What is the data revolution? There are numerous definitions, but perhaps the most useful comes from the report by the UN Secretary General's Independent Expert Advisory Group. It speaks of an "explosion" in the volume and production of data matched by a "growing demand for data from all parts of society". But it goes further than discussing supply and demand. It says the data revolution must address global inequalities in access to and use of data and should aim to "monitor development progress, hold governments accountable and foster sustainable development"⁴.

So, a data revolution that works for developing countries is not just about generating more data. It is about providing the right data to the right people at the right time and in the right format. Data in this context provide the evidence to identify problems and concerns, to identify who the poor are and to determine why they are disadvantaged. When we describe economies, societies and people's lives in numerical form, we unleash the power of statistical analysis. This allows us to identify trends, to compare and contrast what is happening in different locations and to understand better the environment in which the poor live and from which they derive their livelihoods.

It is in this way that data becomes information, that information becomes knowledge, and that knowledge can drive the actions needed to eliminate extreme poverty.

Building on the IEAG report, this report proposes a data revolution for sustainable development with three main elements, all equally important. First, a major and sustained increase in the generation and use of data to help countries and the world eliminate extreme poverty, ensure no one is left behind and better manage natural resources. Second, real institutional change and much more effective use of technology to improve the performance of everyone involved in the production and use of data. And third, major improvements in data accessibility to

ensure governments and decisions makers can be held to account.

1.2. ONE HUNDRED AND THIRTY-NINE DATA REVOLUTIONS

How can this be achieved? If we are to be realistic about ensuring the data revolution reaches developing countries, we must use existing resources and institutions. And that means existing national statistical systems. Yes, the private sector – both commercial and civil society – must also be involved, and probably increasingly so over time. But national statistical offices will be at the core of the data revolution in developing countries, a reality already widely recognised⁵.

There are four main reasons why national statistical systems must play this role:

1. Natural starting point: National systems are where the often limited statistical expertise is available in most developing countries. A data revolution for development needs to strengthen this capacity.
2. Quality assurance role: In the emerging post-2015 world, data from non-traditional sources, such as the private for-profit and non-profit sectors, will increasingly be used, but they will need to be checked for quality and to determine the possibilities for merging them with data from traditional sources. National statistical offices will have to be put into the position to act as a "quality assurer" or "gatekeeper".
3. Managing the downsides of the data revolution: There are many risks and concerns associated with the data revolution regarding privacy and confidentiality. National statistical systems have established legal frameworks, standards and ethical principles to protect the confidentiality of data about individuals. These rules may need both deepening and widening, but building on what is already in place should help to increase trust in the data process.

IN 2013, UNICEF ESTIMATED THAT WORLDWIDE ABOUT 35% OF ALL LIVE BIRTHS WERE NOT OFFICIALLY REGISTERED, A PROPORTION RISING TO 62% IN THE LEAST DEVELOPED COUNTRIES

4. Data and statistics are national public goods: To extract maximum value from it, the data used to understand, design and monitor the development process should be as up-to-date as possible and made widely available. National statistical systems already do this. National statistics and data are public goods⁶ that are disseminated in line with established procedures and protocols. Once again these may need strengthening, but working with and through established statistical agencies and systems builds on what is already in place.

As this report, and the work of PARIS21 over the past 15 years, makes clear, national statistical systems in many developing countries are not currently ready to assume this role. Understanding the problems and constraints affecting them and identifying what is needed to make them work more effectively will be at the heart of the data revolution. Drawing on extensive consultations with countries, this Road Map sets out what needs to be done to build better data institutions – the rules, procedures, people and organisations – that can provide the data needed to drive sustained development.

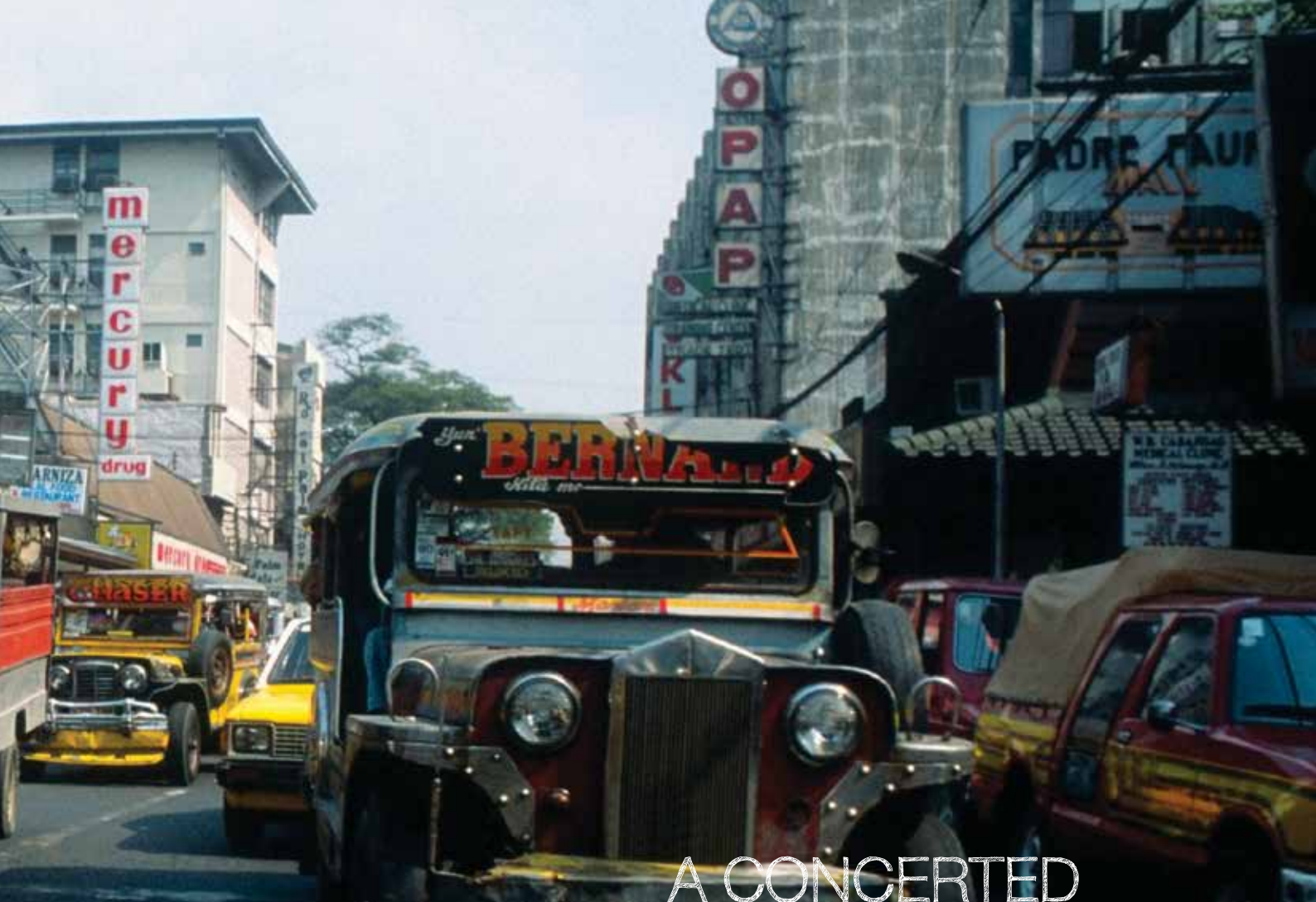
Recognising each country's unique state of national statistical capacity, what is needed is not a single data revolution but 139 data revolutions. Together, these revolutions should generate the data needed to monitor progress towards the Sustainable Development Goals (SDGs). Individually, they should support national policy-making, monitor outcomes and empower poor people and poor communities.





TWO: THE FOUR PILLARS OF THE ROAD MAP

010101010
01000100000
00000010101
001010001
10101010100
01010001010
0111110101
10101010101

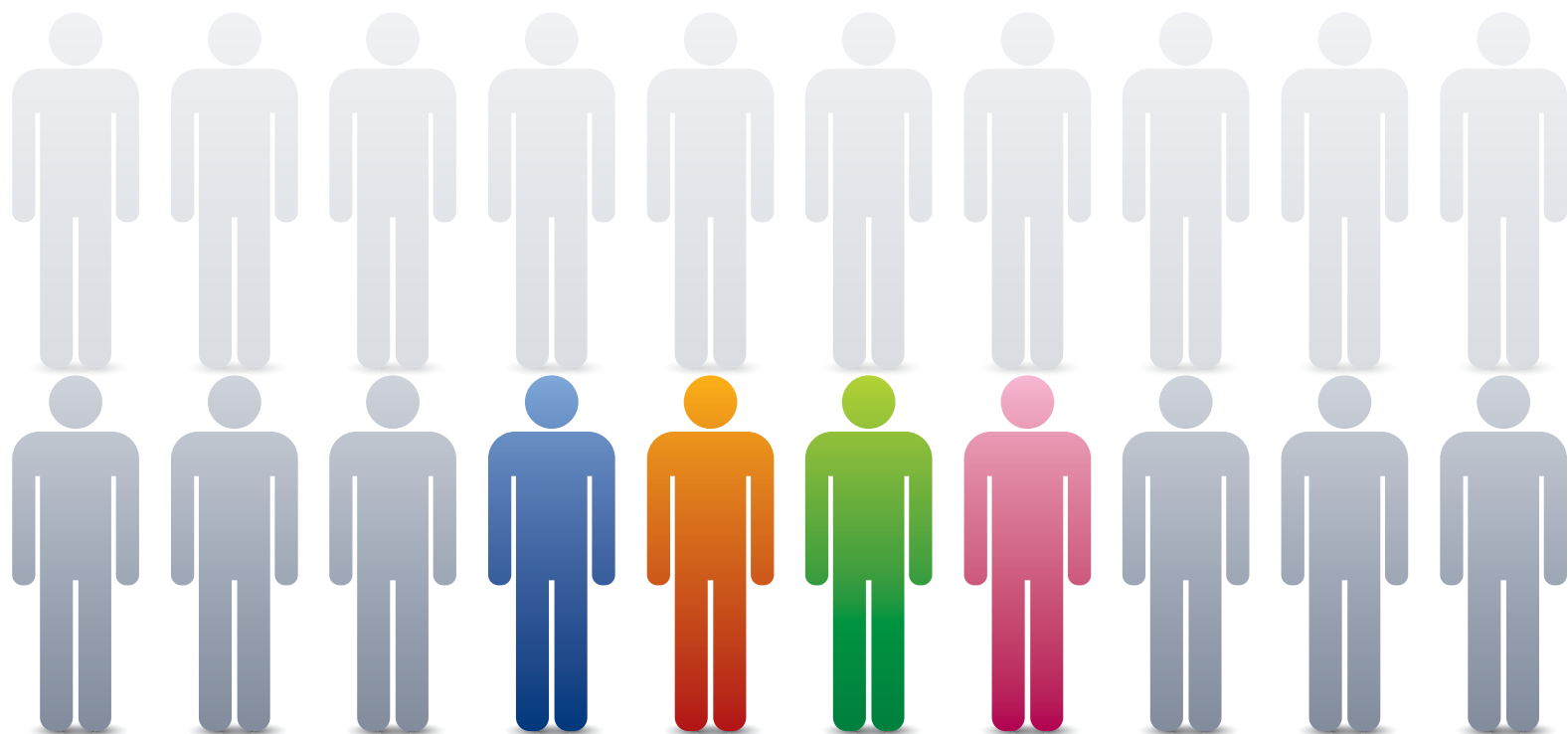


This Road Map sets out a broad programme of actions to help developing countries meet the challenges of the post-2015 development agenda and the data needs related to the Sustainable Development Goals. It is based on information collected and analysed as part of the Informing a Data Revolution project⁷ (see Annex – Methodology) and is designed to help countries deal with and overcome the problems they face in improving the availability and use of data for their development.

A number of challenges common to many, although not all, developing countries were identified in the cross-country survey and in-depth country studies carried out as part of the IDR project:

- National statistical offices have only limited powers and status within national statistical systems.
- There is too little investment in people and skills.
- Data are not adequately disseminated and used.
- The potential of Information Technology is not fully harnessed.
- The design and management of statistical processes is not satisfactory.
- Technical and financial aid is not well-aligned with national priorities.
- Countries face significant costs in managing aid projects.
- The overall coordination of national statistical systems is a concern.

A CONCERTED
EFFORT
FROM THE
INTERNATIONAL
COMMUNITY
OVER THE NEXT
15 YEARS WILL
BE NEEDED TO
ENSURE THAT
SDG MONITORING
DOES NOT IMPOSE
INORDINATE
COSTS ON
DEVELOPING
COUNTRIES



The setting of new goals for the post-2015 development agenda is a political process, and so beyond the scope of this report. But it is clear that the indicator and data requirements of any new framework risk being a burden for some developing countries. A concerted effort from the international community over the next 15 years will be needed to ensure that SDG monitoring does not impose inordinate costs on developing countries or divert resources from achieving national statistical development strategies.

This will require a substantial increase in the proportion of official development assistance currently devoted to statistics (see Section 3). At the moment, this accounts for only around 0.5% of ODA. If developing countries are to build the necessary capacity to meet the data challenges of the next 15 years, that proportion will need to double. And this increased investment will need to start soon – if countries wait until 2030 to start developing their statistical capacity, it will be too late.

As well as increased funding, this report makes a case for two other “big ideas” to drive the data revolution. The first is the creation of a data compact (see Section 2.2), where countries would sign up to a limited set of basic principles and receive, in return for progress, enhanced and flexible financial and technical assistance. The second is the creation of an annual Data for Sustainable Development Report (see Section

2.4) by PARIS21, which would examine the ability of countries to measure the SDGs, the progress they have made towards producing good statistics and report on levels of domestic and international resources to fund statistics.

In making its recommendations, this report follows the same four action areas identified in the IEAG report (see Figure 1):

- Capacity and resources;
- Principles and standards;
- Governance and leadership; and
- Technology, innovation and analysis.

The focus is on two main time periods. First, what needs to be done immediately to develop a baseline from which future progress can be measured. During this phase, quick wins that can be implemented immediately and at low cost will be sought. Second, what needs to be achieved in the medium to long term from 2016 to 2020 and beyond.

This report also discusses the longer term, from 2020 to 2030. Here there are many unknowns. No one can predict how technology will develop, what new challenges countries will have to face or what data needs will actually be. For this time frame the Road Map will need to set out a vision and a framework rather than providing a detailed plan.

THE FOUR PILLARS OF THE ROAD MAP

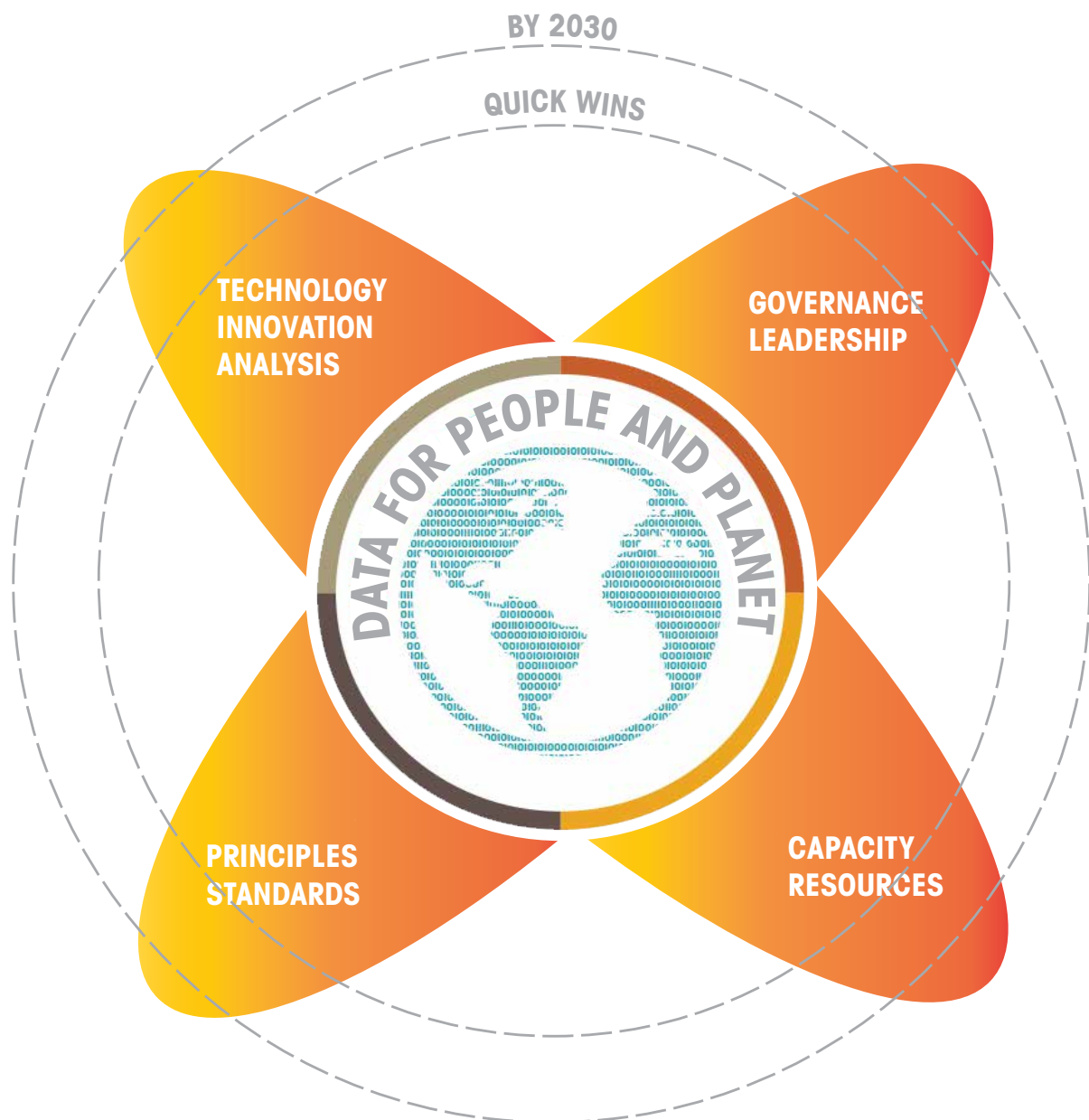


Figure 1: The four pillars of the Road Map
(based on IEAG report, 2014)

2.1. CAPACITY AND RESOURCES

The past 15 years have brought major improvements in the capacity of statistical systems in developing countries but, clearly, problems remain (see the Challenges for Countries box)⁸. Overall, in too many countries, statistical agencies and what they do are undervalued and under-appreciated. The data revolution will need to turn a vicious cycle of underperformance and inadequate resources into a virtuous one where increased demand leads to improved performance and an increase in resources and capacity. The good news is that the IDR project has found enough examples of how this can be done to demonstrate what can be achieved. What needs to be done now is to make sure it can be put into effect everywhere.

The data revolution will require national statistical agencies to work with many different partners, both nationally and regionally (see Section 2.4: Governance and Leadership). But as well as posing challenges, these interactions promise benefits. At the regional level, there is scope for economies of scale in developing and sharing common approaches and to create regional centres of excellence. It will be essential, therefore, to ensure that there is capacity for coordination and leadership right from the beginning and that capacity strengthening takes place across all agencies both within the national statistical system and the region.

Capacity development is not just for data producers. If the data revolution is to serve the needs of the poor themselves, investment in the needs of users will also be essential. Intermediaries, including the media will be important in helping to fill the gap between data and knowledge.

In all this, countries are key. One of the main lessons of the past 20 years has been that top-down initiatives do not lead to a sustained increase in capacity⁹. Instead, success comes when countries get the support they need to set out their own

priorities, goals and strategies for the development of their statistical systems. By 2014, almost all developing countries had developed and implemented such plans, collectively known as National Strategies for the Development of Statistics¹⁰. There have been some concerns about the way that strategies have been developed and these will need to be addressed. Some, for example, have focused only on national statistical agencies. Others have set unrealistic goals and have not always been well integrated with other national planning processes¹¹. Nevertheless, with appropriate guidance and some modifications, the national strategy process can provide the basis for an effective and sustained data revolution in developing countries.

2.1.1. ACTIONS TO ESTABLISH THE BASELINE AND HARNESS QUICK WINS

Countries should update their strategic statistical plans to meet the data needs of the post-2015 development agenda. These plans should...

- Be an integral component of national development plans and poverty reduction strategies;
- Identify immediate opportunities for introducing innovations and improvements;
- Align with the NSDS process as recommended in the PARIS21 NSDS Guidelines;
- Explore possibilities for public-private partnerships for data production;
- Within the framework of the SDGs, a national statistical capacity indicator should be developed and regularly monitored, drawing on the PARIS21 Metabase (metabase.paris21.org/);
- Countries should regularly hold user-producer dialogues to discuss statistical issues and to seek the buy-in and support of senior figures in government.

THE CHALLENGES FOR COUNTRIES

Capacity building is a struggle for each of the countries participating in the IDR project's in-depth studies, although to varying degrees. The most common obstacle is a shortage of financial resources, which makes it hard to recruit and retain qualified staff and to develop adequate infrastructure.

Bangladesh, Burundi, the Democratic Republic of Congo (DRC), the Philippines, and Trinidad and Tobago all report shortages of qualified staff. In the Philippines, trained staff in the Philippine Statistical Authority (PSA) often transfer to international institutions and the NSOs of other countries or resign to consult in the private sector.

Budgetary and infrastructure constraints are also prominent. In DRC, limited financial resources jeopardise the ability of the National Statistics Institute to carry out statistical activities. In the Philippines, in addition to an overall decrease in budget, funding set aside for statistical developmental activities is not consistently provided.

Trinidad and Tobago's Central Statistical Office (CSO) is in crisis because of a lack of office space. In 2013, following industrial action, the CSO urgently vacated its offices, as they were not compliant with occupational health and safety regulations. The CSO currently occupies a temporary office too small to accommodate all staff, forcing some to work from home without effective communication with the office.

Both the CSO and PSA report difficulties in managing their own human resources. In Trinidad and Tobago, there is insufficient control over staff recruitment. While in the Philippines, the problem is two-fold. First, PSA has limitations on using budget to hire personnel. Second, government hiring procedures take time, making it difficult for agencies to hire qualified statisticians who cannot wait through the protracted hiring process.

LESSONS LEARNED

Increased investment is needed to attract, recruit, train and retain the most qualified staff. Given budget constraints in many countries, however, it is more realistic to explore innovative and cost-effective solutions for building a pool of well-prepared statisticians who regard national service as a viable and attractive career choice. As far as limited infrastructure is concerned, IT solutions should be leveraged that make it possible, for example, for non-essential staff to work remotely, if necessary.

2.1.2. ACTIONS FOR THE MEDIUM AND LONG TERM

- Each country should develop a programme to strengthen statistical literacy, beginning with professional statisticians, data scientists and data managers. These programmes should then use the existing education system to embrace the wider population by improving teacher training in numeracy, adapting syllabi and creating educational materials.
- Governments should raise the status of statisticians by establishing statistics as a separate profession in the civil service cadre with salaries scaled up to attract and retain the right candidates.
- With the support of regional institutions and PARIS21, regional training exercises in capacity development should be organized. These could become the basis for the establishment of peer review exercises in the longer term. Regional centres of excellence should be established to share new approaches and know-how.
- By 2020, all IDA countries – classed by the World Bank as the world's poorest countries – should have increased their domestic share of funding for national statistical systems.

2.2. PRINCIPLES AND STANDARDS

A key reason for placing national statistical systems at the heart of a country-led data revolution is that they already have a set of core principles for managing data and a process to establish and promote standards for different aspects of data work. If the data revolution is to be effective, these principles and standards must be applied as widely as possible.

The observance of principles and the use of common standards are important for several reasons. They reassure users that they can trust the data; they allow data from different sources to be compared and contrasted; and they reassure citizens that their personal details will remain confidential. Given the threat that new technologies and data sources pose to privacy, this last point is of growing importance. Citizens have a right to expect that the protection they currently enjoy under existing statistical legislation and practice is extended to data from other sources, especially so-called big data derived as a by-product of large scale business operations.

The development and adoption of principles and standards is an area where the international and national statistical systems need to work closely together and where developing countries must be actively supported. Overall, there are three areas of action:

Adopting and using key principles: One possible way to encourage this among countries is by developing and promoting a data compact (see Box 1). This would see countries sign up to a limited set of basic principles and receiving, in return for progress, enhanced and flexible financial and technical assistance.

Promoting the right of access to data for all users: Some countries already have specific legislation in place; elsewhere this is provided for in statistical

legislation and in policies and practices. The principle of equal and open access to data should be a key principle of the data revolution. Where concerns over privacy can be met, the adoption of so-called open data should encourage intermediaries to deliver data to users in appropriate formats.

Promoting technical standards: While there are various processes to develop and agree standards for different aspects of the statistical process, in many cases the rate of adoption is relatively slow. Under the data revolution, resources will be needed to support and accelerate the rate of adoption of key standards and to actively monitor this process.

2.2.1. ACTIONS TO ESTABLISH THE BASELINE AND HARNESS QUICK WINS

- As a pilot project, a limited number of countries and donors should sign a data compact.
- Common technical platforms and data standards should be agreed to ensure the rapid and comprehensive dissemination of data, indicators and other statistics.
- Countries should receive immediate technical support to improve the coordination between civil registration and vital statistics (CRVS) to make more effective use of data derived from administrative processes, such as CRVS.

COUNTRIES
AND DONORS
SHOULD SIGN A
DATA COMPACT

THE CHALLENGES FOR COUNTRIES

Most of the countries participating in the IDR project country studies report that their national statistical offices have legal and regulatory frameworks in place. However a number of these now require updating.

The Philippines has tried to abide by the Fundamental Principles of Official Statistics (FPOS) but, in practice, data providers are not fully compliant with the law, which affects the timeliness, reliability and accuracy of statistics. In both the Democratic Republic of Congo and Burundi, legal and regulatory frameworks need to be updated, while in Trinidad and Tobago a statistics law is in place but there is no national strategy for statistics.

Colombia's National Administrative Department of Statistics relies on non-mandatory or completely voluntary regulations, such as the National Code of Good Practices. As a result, many aspects of statistical activity, including those of the national statistical service itself, are not sufficiently or systematically regulated.

On the question of open data, the studies make clear that the seven countries still have much to do, with some reporting problems in making even basic data available to users. By contrast, both Colombia and Cabo Verde have good dissemination records and have taken steps towards open data policies. The Philippines has embarked on an open data initiative, although this has still to lead to substantive results. Efforts to adopt standards are hampered by a lack of coordination throughout entire national statistical services in all cases. A key to implementing adoption of technical standards is a quality framework mechanism. Only Bangladesh, Colombia and the Philippines currently have such a framework in place.

LESSONS LEARNED

Governments should take steps to enact the legislation required to coordinate the national statistical system making it easier to implement the standards needed to improve data quality. Open data policies should be adopted. In parallel, inventories of all data available throughout the national statistical system should be carried out and this data should be accessible in a standard format.

2.2.2. ACTIONS FOR THE MEDIUM AND LONG TERM

- Statistical legislation should be reviewed and revised, where necessary, to ensure it remains relevant and responsive to emerging data needs, for example in areas like the protection of confidentiality, use of big data, open data and statistical standards and frameworks.
 - International statistical standards should be in place to make use of complementary sources of statistics, such as administrative data and big data.
- By 2020, 60% of IDA countries should have documented and archived their data sets and should be providing online access to microdata where confidentiality is assured.

BOX 1. A DATA COMPACT FOR THE DATA REVOLUTION

For the data revolution to work, the right incentives must be in place for all stakeholders. This report proposes that governments in developing countries, external funders, citizen groups, media and technical agencies sign data compacts that establish a performance agreement based on the individual country's own NSDS. In return, these would be underpinned by financial agreements. A portion of the agreed support – whether from the country's own budget or from an external funder – would be contingent on progress towards "good data," or data that is accurate, timely, available and usable, and meets established standards.

On the side of countries, the compact could require governments, to:

- Commit to and develop an NSDS action plan that, as far as possible, explores the integration of non-traditional data providers and users.
- Ensure that statistical legislation is up to date and in line with the Fundamental Principles of Official Statistics.
- Promote the effective coordination of data-related activities.
- Promote access to and the use of data and statistics based on open data principles.
- Ensure that data-related activities are adequately funded.

In return, external funders, including bilateral donors, multilateral agencies, development banks and others, could be required to:

- Improve support for data-related activities, including providing funding contingent on progress towards "good data".
- Fund or provide technical assistance to strengthen the capacity of data providers and users.
- Ensure activities are aligned with the NSDS, the national development plan, and coordinated with other donors.
- Provide support in ways that minimise the burden on countries and make use of local processes and data.
- Undertake research and development to promote and support the use of innovations.

Other features of the data compact could include a challenge fund that encourages countries to bid for resources (see Section 3.3).



A PORTION OF THE
AGREED SUPPORT...
WOULD BE CONTINGENT
ON PROGRESS TOWARDS
“GOOD DATA,” OR DATA
THAT IS ACCURATE,
TIMELY, AVAILABLE
AND USABLE



2.3. TECHNOLOGY, INNOVATION AND ANALYSIS

New technologies and other innovations will not provide all the answers for the data revolution, but they will certainly play a crucial role. The Innovations Inventory (<http://innovation.paris21.org/>) constructed as part of the IDR project demonstrates what can be done. It identifies innovations across three domains – new technologies, such as mobile data-collection devices and remote sensing; new forms of organisation, such as crowdsourcing and private partnerships; and institutional innovations, such as open data and digital activism.

The rate at which such innovations are identified will only accelerate in the years to come. A major concern for the data revolution will thus be identifying the innovations that work best for developing countries. Given the lack of resources in many developing countries, much of the research and development will happen at the regional or international level. But it will need to take better account of countries' needs and concerns. This has not always happened in the past. Where innovations, for example new software tools, have been developed and disseminated by international agencies, countries have found it difficult to evaluate and assess their suitability. Often the tools are promoted as part of an aid or technical assistance package and countries may feel obliged to take them if they want the other parts of the package¹².

2.3.1. ACTIONS TO ESTABLISH THE BASELINE AND HARNESS QUICK WINS

- The Innovations Inventory developed by PARSIS21 should be regularly updated and extended to help disseminate information about innovations more widely.
- Pilot projects testing innovations in the field should be developed.

- Countries should upgrade their national statistical web sites, establish data portals and use existing tools to improve access to statistics. Access to data derived from administrative processes could also be improved through automated data capture and transmission. By 2020, databases and information systems across national statistical systems should be harmonized to facilitate seamless data sharing.
- Campaigns and data challenges, such as the Orange Data for Development challenge and the Big Data Climate Challenge, should be used to encourage data-driven innovations to address country-specific problems.

2.3.2. ACTIONS FOR THE MEDIUM TO LONG TERM

- Priorities identified by developing countries for statistical research and development should feed into the work programmes of regional and international agencies.
- Countries should have access to independent advice on new technologies and tools and their relative strengths and drawbacks. They should further be able to use harmonized software, technologies and tools that would allow them to share data.
- A core set of innovations should be identified and adopted by at least 50% of relevant countries within a period of five years.
- By 2020, 40% of IDA countries should be making use of remote-data capture for surveys like Living Standard Measurement Studies.

THE CHALLENGES FOR COUNTRIES

Technology and infrastructure issues are widespread – and often “acute” – in the statistical systems of developing countries, greatly limiting their capacity to disseminate data and serve users.

Several of the seven countries that took part in the IDR project’s country studies reported that staff rely on outdated computers and systems. For example, in Trinidad and Tobago’s Central Statistical Office, there is only limited networking of computers. Staff also lack access to specialised statistical software and many have to use personal, rather than professional, e-mail addresses. The picture was more positive in Colombia and Cabo Verde. In the latter, recent investment means statistical staff can now access modern ICT technologies, including telephones, Internet and e-mail.

Dissemination of data and metadata was widely cited as a major problem. The Bangladesh Bureau of Statistics (BBS) hopes to establish a data warehouse but has yet to acquire the necessary equipment. Users who require certain types of data must physically visit the BBS’s offices and no system is in place to provide them with metadata. The bureau’s website is only partly functional. Dissemination is also an issue for the Burundi Institute of Statistics and Economic Studies. Its lack of a partnership with the media means statistical releases receive relatively little attention.

The situation was more encouraging in Cabo Verde, where all National Statistical Institute publications are available free online. Similarly, interviewees for the Colombia study said the National Administrative Department of Statistics (DANE) had made significant improvements in data dissemination. DANE now has an official publication policy and shares metadata in a standard format.

A final area of concern is access to microdata and the absence of adequate archiving systems for data and metadata. The BBS provides only limited access to microdata, for example, while in the Democratic Republic of Congo data from the 1984 census have still not been digitally stored.

LESSONS LEARNED

Implementing an effective data and metadata dissemination platform is clearly key to resolving some of the problems identified in the country studies. In addition, access to microdata should be facilitated, although in some countries this would require changes in legislation.

2.4. GOVERNANCE AND LEADERSHIP

Improving the governance and leadership of statistical systems will be a central requirement for the data revolution. Evidence compiled in the course of the project indicates that improvements will be needed at two levels. First, within countries, to strengthen coordination between agencies and to enhance the leadership role of national statistical agencies. Second, at the regional and international levels, where the voice of developing countries needs to be heard and where countries should be encouraged and supported to play a more prominent role in international coordination.

Evidence from the country studies suggests that while many national statistical agencies are able to adopt international standards and follow good practice, they have limited ability to promote the use of these standards by other agencies and to coordinate statistical activities across the national statistical system. Even where provision is made in legislation for coordination, this has often proved difficult to achieve in practice. One issue is the status of the national statistical agency and its ability to provide leadership and promote coordination to other parts of government. Where resources are constrained, national statistical agencies find it difficult to manage their own work programmes, let alone provide coordination and leadership to others. The problems seem to be particularly severe in statistical units located in ministries and government agencies, including areas such as health, education and agriculture, all key for sustainable development¹³.

Internationally, there are concerns over channels of communication and the ability of small statistical agencies in less developed countries to get their voices heard and their views expressed in different forums.

2.4.1. ACTIONS TO ESTABLISH THE BASELINE AND HARNESS QUICK WINS

- As part of the proposed data compact, national governments should be encouraged and supported to enhance the status and coordinating role of national statistical agencies.
- Mechanisms should be established to monitor the use of national standards and good practice throughout the national statistical system.
- Countries should be encouraged to establish national partnerships for the data revolution¹⁴. These should build on existing structures and institutions and involve as many stakeholders as possible.
- An annual Data for Sustainable Development Report should be developed, to be prepared by PARIS21 for discussion at the UN Statistical Commission. It should examine the ability of countries to measure the SDGs and the progress they have made towards producing good statistics and report on levels of domestic and international resources to fund statistics.

2.4.2. ACTIONS FOR THE MEDIUM TO LONG TERM

- Within countries, mechanisms and processes for communicating with data users need to be strengthened and enhanced. By 2020, a majority of developing countries should have a formal process in place to do this and to regularly gather user feedback.
- Data sharing between the various national statistical agencies and international organisations should be strengthened, subject to the management of privacy concerns.
- By 2020, 30% of IDA countries should have mechanisms in place to provide for automatic data sharing between agencies for statistical purposes.

THE CHALLENGES FOR COUNTRIES

Overall, the seven countries where the IDR project carried out in-depth studies have spotty records on governance and leadership (see also Section 2.2: Principles and Standards), although there are some bright spots. While each displays a willingness to better coordinate activities across its national statistical system, most struggle to deliver. Data sharing, both from NSOs to users as well as between various government agencies, is also inconsistent. There are, however, examples of successful tactics employed to improve dialogue with users.

Most of the seven countries have passed legislation that regulates the coordination of the national statistical system; some of it is very specific and robust. For example, the Philippine Statistical System is recognized worldwide for the relative strength of coordination of its national statistical system. The picture is less encouraging elsewhere. In Trinidad and Tobago, there is no formal coordinating committee to bring together the main statistics producers. In the Democratic Republic of Congo, coordination is poor due to the absence of a collaboration protocol between the National Statistics Institute and industry units.

Success communicating with users also varies. In Bangladesh, the NSDS was prepared using a participatory approach, while DRC has begun a national dialogue between producers and users of statistics in the form of Statistical Focus Groups. In Colombia, the NSO has official procedures for consulting users and says that it holds a public accountability campaign at least once a year so data users can voice their opinion about the statistics they produce.

However, overall, much remains to be done to strengthen relations with users. In Trinidad and Tobago, many users interviewed were highly critical of how the Central Statistical Office dealt with them, with some saying they now looked exclusively to other data sources, national and international. Questions also linger among stakeholders in some countries about the independence of NSOs, calling into question users' faith in the accuracy of official data.

LESSONS LEARNED

Regular consultations with users clearly benefit both the data producer and user experience in NSSs and should be encouraged. This will also go a long way to improving perceptions of transparency and collaboration, which are the foundations of trust-building. Strong examples of inter-agency coordination do exist and leaders in this area within every region should share experiences on establishing and maintaining coordinated systems.

0101010111111010
01000010001000001010100100
01001001000100100100100
1010100010101101010101111
010101000010101010
000001010101
101010101010101
10101001010100101011101
101011110010000010000001
101000101000101010101001
101011111010101010101001
010
010101011101010101010101
1010101100001010101010001
10101010101010111110101010
010100010000010000001
101000101000101010101001
1010111110101010101010
010010101010101010100101
0000010111111010000111101
0111011010101010010001010
0101010100101010010010
1011110101010101111110
011101010101010101001010
010101010101010101010101
101010100001010101111101
1011010111010110010
1000000010101010101
101010101010100101010010
011101010101110100110
010101010010101010101010
0101100001010101000101
101010101010110101010101
01
100101010101010101010101
11110101

THREE: IMPLEMENTATION





Turning the data revolution into a reality will require action across many fronts. In addition to strengthening existing partnerships, greater collaboration will be needed, both internationally and at the regional and country levels. Partnerships will also have to spread their net far beyond the traditional statistical community. Increased funding will be needed from domestic and commercial sources and from the international community. This funding should be seen not as a cost but as an investment that will yield both cost savings and better data over the long run. New forms of funding will also be needed, such as trust funds and challenge funds. And proper monitoring, drawing on the work of PARIS21 and the IDR project's Metabase developed by PARIS21, among other sources, will be essential to identify where progress is being made and where countries are slipping behind.

3.1. BUILDING PARTNERSHIPS

If the data revolution is to become a reality, many actors will need to be involved, including some that are not currently engaged in the data or statistical process. For a country-led data revolution, a large number of stakeholders in countries will also need to be engaged, including:

- Political leaders and decision makers;
- Government officials;
- Statistical offices and other public and private data producers;
- Civil society organisations and other lobby groups;
- Scientists, teachers and researchers;
- The media;
- Business leaders and investors;
- Private and public donors, including the philanthropic sector; and
- Citizens as individuals and as members of different communities.

At the global and regional level, various international and regional organisations will also have an important role to play, even if at present better data may not necessarily be at the top of their agendas. Better data have a crucial role to play in supporting and

BOX 2. COST SAVINGS POTENTIAL OF THE DATA REVOLUTION

Mobile devices offer substantial opportunities to collect data more cheaply. For example, a survey programme of six surveys in a given 10-year period and about 13,000 households per survey (using an East-African country), using traditional paper questionnaires and processing is estimated to cost about US\$1.8 million per 10-year cycle. Such surveys require multiple steps, including reproducing the questionnaire, providing and supervising data entry personnel and machines at a central location, transporting the questionnaire and running regular data edits. The same survey using Android mobile technology and free data processing software could cut data processing costs by about US\$1.2 million, a saving of over 60% in data processing.

The survey costing estimates prepared for the UN SDSN Needs Assessment¹⁹ to monitor the Sustainable Development Goals (SDGs) indicate that the data processing component to undertake a 15-year survey programme for reporting on development indicators in all International Development Association (IDA) countries would be US\$74 million. Applying new technology for only one component of the survey programme, namely data processing, could save about US\$44 million. Applying new technologies in other areas could also add to the savings. Sharing these cost-saving techniques across regions and countries through the Innovations Inventory or other online resources will ultimately pay for itself.

strengthening accountability, but not all agencies will be comfortable with this concept or appreciate its importance.

The data needs of developing countries must be championed, and all actors will need to remain as engaged as possible to ensure that these remain in the forefront. Agencies with a proven track record in advocacy, such as PARIS21, will have an important role to play. The proposed World Forum on Sustainable Development Data will also be a valuable addition to international advocacy efforts.

3.2. FINANCING THE DATA REVOLUTION

Mobilising and delivering additional finance for statistics, as well as technical assistance, will be crucial. The nature of development data as a national and global public good means that most statistical and data-related activities will continue to be financed by governments from tax revenue¹⁵. In some of the least developed countries, financial and technical aid will continue to be a crucial source of funding, both for day-to-day activities and capacity development. In many countries, the past 15 years has seen some increase in resources for statistics, both from national budgets and aid¹⁶. But analysis by the IDR project indicates that the current levels are unlikely to be sufficient to achieve a real and lasting data revolution.

Funding will need to come from two main sources – national budgets and aid – and both will need to be increased substantially. But how much will be needed? A number of attempts have already been made to develop a typology to quantify the amounts needed¹⁷, but perhaps the more important point is this: money invested now is likely to bring substantial savings over the long term. The Health Metrics Network's assessment of commonly used data collection approaches, for example, provides an indication of the extent of cost savings with improved CRVS systems¹⁸. Box 2 below lays out the cost savings potential of data collection with mobile devices.

For the short term, funding for statistics needs to be increased from current commitments of be-



APPLYING NEW TECHNOLOGY FOR ONLY ONE COMPONENT OF THE SURVEY PROGRAMME, NAMELY DATA PROCESSING, COULD SAVE OVER US\$44 MILLION A YEAR GLOBALLY

tween US\$300 million and 500 million to between US\$1 billion and 1.25 billion by 2020. (This would be combined with an increase of up to US\$1 billion by 2020 in budget allocations for data and statistics from domestic resources.) The level of aid proposed would then represent about 1% of ODA as reported by OECD in 2012²⁰.

This increase should provide for most of the recommendations outlined above to be implemented. In particular, countries would be supported to put in place a minimum statistical programme by 2020 to monitor the SDGs and to provide the data needed to guide national development. This would include a regular programme of household surveys, participation in the 2020 round of population censuses and major improvements in data accessibility and use. Financing for such regular survey programmes, aligned with national needs, is well placed to incentivise countries to make sustained investments in statistical capacity, particularly staff resources. Such country-driven investment in human resources will, in the medium term, strengthen countries' absorptive capacity for the increased monitoring demands of the SDGs. In the short term, several of the immediate investments proposed in this report's recommendations will free up staff resources rather than constrain them. For example, investments in IT infrastructure will immediately boost staff productivity and educational programmes will build staff capacity in the medium to long term.

3.3. NEW WAYS OF FUNDING THE DATA REVOLUTION

Feedback from the country survey as well as the in-depth studies indicates that many countries have found the management of aid projects to be difficult and time consuming. While aid commitments have increased to some extent, there is evidence that disbursement on the ground is constrained by complex requirements for procurement and financial management and the need to deal with many different donors²¹. So, if the data revolution is to succeed, attention will need to be given to how finance is provided.

Both new financing mechanisms and new ways of delivering aid will be needed. This report recommends that financing mechanisms should include the following:

- Global and, possibly, regional trust funds supporting the implementation of the data revolution. This fund should be tailored to the low income countries and promote capacity building, data production, data use and innovation.
- A data compact challenge fund, where countries bid for resources, based on their statistical plans and progress towards implementation.

In relation to making aid easier to access and use, aid for statistics should be allocated and disbursed in line with the following principles:

- It should be in line with national priorities and programmes as set out in national statistical plans and strategies. In effect, aid for statistics should move from a project to a programme approach.
- To reduce the transaction costs facing countries dealing with several donors, aid should be managed on a system-wide basis, in line with PARIS21 recommendations²².
- Experience of other financing mechanisms, including payment by results and budget support in line with an agreed programme of reform, should be reviewed and evaluated. For the period after 2020, it is anticipated that an increasing proportion of aid will be provided through these kinds of approaches.
- Support and guidance should be provided to countries participating in the data revolution to develop financing proposals and programmes. This may include the identification of lead donors in countries and the provision of technical support. In some cases such support may be provided on a regional or sub-regional basis.

3.4. MONITORING PROGRESS

At the country level, monitoring the progress of the data revolution should be an integral part of the process of implementing the national statistical





strategy or plan. Countries will be encouraged and supported to set targets and to identify indicators to regularly measure progress. It is expected, for example, that regular reporting on progress would be part of the data compact and would be compiled in the annual Data for Sustainable Development Report.

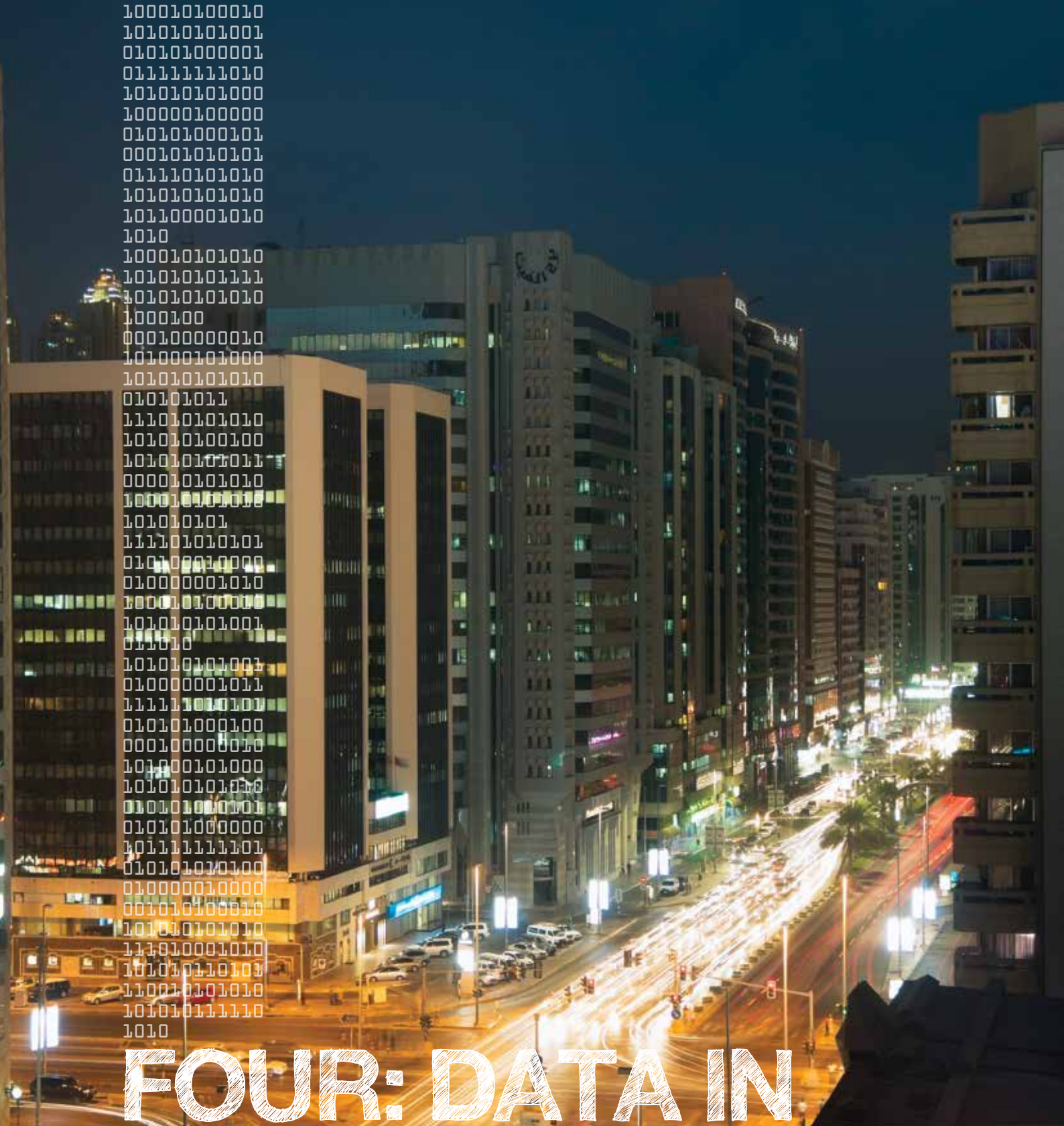
At the regional and global level, the aim should be to make reporting and monitoring of progress as automatic as possible. It is anticipated, for example, that the PARIS21 Metabase (<http://metabase.paris21.org/>) will be the main means for monitoring what is happening in countries.

An equally important aspect of global monitoring is to ensure that financing for statistical informa-

tion is robust and that funding instruments and approaches reflect the new modalities and actors in development finance. In this regard, the Partner Report on Support to Statistics (PRESS) exercise has proven useful in providing information from ODA providers on their support for statistical development. Based on the PRESS experience conducted at the international level, PARIS21 launched a pilot exercise named Country Report on Support to Statistics (CRESS) at the country level. The CRESS is a country-led initiative to gather all data relating to the funding of the national statistical system, whether deriving from domestic resources or external aid. It is intended that these exercises will be developed and expanded over the period to 2020 to monitor financial commitments to the data revolution.



100010100010
101010101001
010101000001
011111111010
101010101000
100000100000
010101000101
000101010101
011110101010
101010101010
101100001010
1010
100010101010
101010101111
101010101010
1000100
000100000010
101000101000
101010101010
010101011
111010101010
101010100100
101010101011
000010101010
100010101010
101010101
111101010101
010100010000
010000001010
100010100010
101010101001
011010
101010101001
010000001011
111110101010
010101000100
000100000010
101000101000
101010101010
010101000101
010101000000
101111111101
010101010100
010000010000
001010100010
101010101010
111010001010
101010110101
110010101010
101010111110
1010



FOUR: DATA IN 2030 – A VISION FOR PRODUCERS AND USERS

MONDAY OCTOBER 21, 2030

As the director of the national statistics office pulls into her parking space this Monday morning, a thought strikes her. It's 15 years, plus one day, since she joined her country's national statistical office. The date is easy to remember – October 20th, World Statistics Day.

A lot has changed, and almost all for the better. As she makes her way through the open-plan office, a young colleague waves to her. "Excuse me director, would you like to take a look at the latest data visualisations?" On screen is a new tool that lets users map immunisation rates across the country and break them down by district and even village. "Great work," the director tells her colleague. "Let's get that on the website as soon as possible."

The website – a never-ending battle, but at least it's one the NSO is beginning to win. Fifteen years ago, only basic statistics were released on the website and they weren't always up to date. Now the website hosts a constant flow of new and disaggregated data from the NSO as well as from ministries and the central bank. It's all regularly updated, ready to be downloaded and fully searchable. And because the NSO has signed up to international standards, agencies like the UN and World Bank can automatically upload statistics as and when they need them.

By the time she gets to her own desk and turns on her computer, her brain is buzzing with things to do. Her inbox is full – of course – but at least now her e-mails all come to her official address. When she joined the NSO, staff had to use their own e-mail addresses.

So, what's on today's agenda? First up is a budget meeting – never much fun, but less frustrating than they used to be. Back in 2015, every major spending request had to be sent up to the planning ministry. Even regular expenditures for survey work, for example, had to be repeatedly justified. That meant staff spending hours in endless meetings,

THE DISTRICT NURSE...

By the time the district nurse's car rattles down the dirt track to reach the village, he's already running late. So much ground to cover, so many patients – if you're a district nurse, that never changes. But other things have changed. For one thing, he now travels lighter than he used to. Gone are the box files and piles of paper that once covered his passenger seat. Today, he accesses and updates his patients' records on his personal digital device, which also keeps track of his appointments. It's become an invaluable tool, not just in his day-to-day work but also to warn him about potentially worrying health trends. Just this morning, his device alerted him about signs of flu spreading through two neighbouring provinces. It's earlier than expected, which means he now needs to get a round of flu jabs organised in a hurry.

As he parks his car, a grinning girl comes running out of a house to say hello. The nurse recognises her – and remembers how much she screamed when she got her measles shot. But at least she's safe from the disease now, just like most kids in his area. Just this morning, he typed "my district's current immunisation rate" into his digital device and was pleased to see that his district was well above the national average. Indeed, the health ministry has identified him as a "best practice" expert, and wants him to help train other nurses around the country. That means he'll be under even more pressure to finish his rounds quickly. Well, some things never change...

explaining – yet again – why better data meant better decisions.

These days, however, the NSO is an independent government agency with control over its own expenditure. Over the past 15 years, it has secured a small but solid slice of government spending. Changing donor attitudes have helped too. They've come increasingly to recognise that they need to fit into the data priorities of the government and the NSO, not the other way round.

The NSO's increasing independence and prestige has also helped it to offer more competitive salaries and to bring in young and talented data professionals. That's another big change. Fifteen years ago, qualified statisticians were often lured away to work in the private sector or in international aid agencies. The director herself had plenty of offers, and she was tempted to quit more than once.

What made her stay? She thinks the turning point was about 10 years ago, when the then-newly appointed prime minister appeared on TV and described herself as "driven by data". Suddenly, every minister around the cabinet table was also "driven by data," and the office faced ever more requests from ministries. The office nearly sank under the demands. It was saved by the prime minister, who – true to her word – made good data a government priority.

Her government passed an open data law guaranteeing the right of access to data and set a challenge for the NSO: meet the needs of the people. The director and her colleagues launched a major effort to find out what users wanted. The results were depressing. Many people had almost no knowledge of how data could be used; those that did found it easier to get the numbers they wanted from Wikipedia rather than the NSO.

So as well as improving its supply of data, the NSO has also been working to educate users, launching public outreach and education programmes. The director can see the results on the front page of that

THE CHIEF OF STAFF...

An all-too-familiar face appeared on the chief of staff's phone – his minister. She was in her home district and, as this was a Sunday night, probably on the warpath. "What's happening to the price of rice?" she demanded. "I want answers – now!"

That's why, on an evening when he should have been planning his retirement, he's scrolling through government websites. "Didn't somebody say something about a national data portal?" he asks himself. A few more clicks and he finds the site. On the screen, a question floats above a search box: "What do you need to know?" The chief of staff hesitates and then enters a question: "Are rice prices rising?" The screen responds: "Rice and food prices remain broadly stable but with some local variations." Below is a list of relevant data – the consumer price index, inflation rates, wages and salaries and more, and all updated to the most recent quarter.

"Amazing," the chief of staff murmurs to himself. "These figures used always to be so out of date. But what about those 'local variations'?" He clicks on the words and is taken to a map of the country coloured to show trends in food prices. The map warns that it's still a trial project, but, sure enough, in the minister's district it's indicating a blip in rice prices. On an instinct, he clicks on a weather symbol, which takes him to a map of rainfall patterns across the country. There again, in the minister's district, are signs of heavy rain and localised flooding. "That explains it," he murmurs to himself, "but how do they know all this?" Never mind, he can call back the minister right away and find out more from the statisticians tomorrow.

morning's e-paper – a visualisation of government spending by legislative district created by a journalist (a self-styled 'infomediary') who has attended several NSO workshops.

Just as she's getting ready to head off to her first meeting, a colleague sticks his head around the door. "Excuse me, one of the chiefs of staff want to know if we can explain some data from his minister's district." She can already guess what it is: "Rice prices?" Her colleague laughs: "Sometimes I think you're psychic."

It's not magic. She has been following one of the CSO's big data projects, part-funded by a consortium of banks, that is tracking food prices through social media and from 'crowd-source'²³ photos of price stickers in markets. The project is designed to provide early warning of shifts in prices. Big data are playing a role in other areas of the NSO's work: Anonymised phone logs from telecoms companies are being used to regularly update population and income figures. And, speaking of phones, the NSO is now increasingly using smartphones to collect data in remote areas, which is producing better quality data faster.

"Excuse me." The director's assistant appears at her door. "Don't forget you need to get to the airport for 5pm." The director sighs ... after a long day at the office, she has to fly off to attend a regional data forum. She's impressed by how her colleagues across the region have worked to develop and spread the use of solutions that work best for them. She's also impressed that many of their ideas are going international, too, feeding into the growing global discussion on how to improve data quality still further as the Sustainable Development Goals come up for renewal.

"Wow," she thinks, "it's amazing how much we've achieved in just 15 years."

THE JOURNALIST...

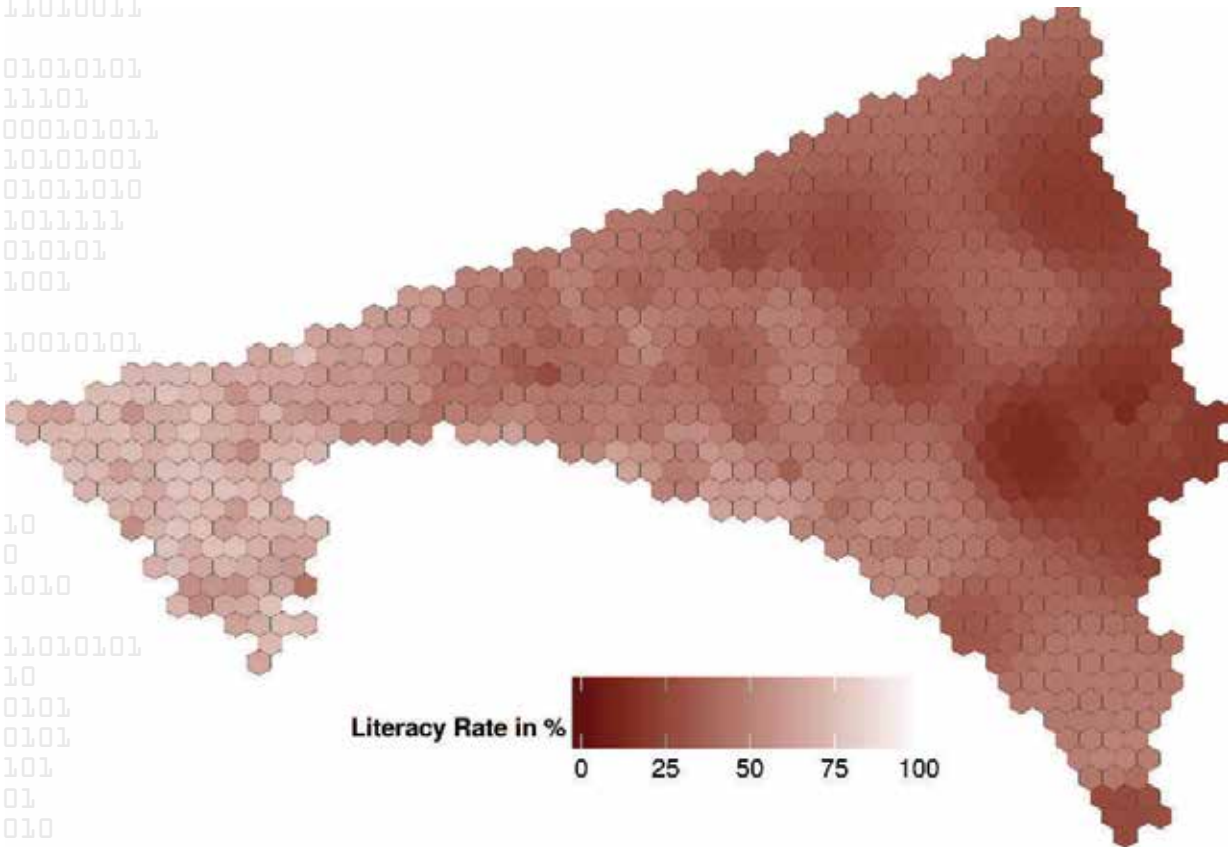
The journalist clicks "send" and dispatches her latest article to her ever-demanding editor. "That should keep him happy," she thinks. It should also create some waves – an interactive visualisation of government spending by legislative district indicating some, well, "interesting" patterns. No doubt there would be phone calls from legislators' assistants in the morning. One or two might even repeat the old accusation: "The problem with you journalists is that you're good with words, not good with numbers."

Maybe that was true once, the journalist reflects, but not now. These days, readers increasingly expect journalists to underpin reporting with hard numbers. That's not surprising – over the past 15 years, statistical numeracy has become a core part of the mathematics curriculum. For journalists, the drive for data in the news can mean hard work, with hours spend studying datasets to figure out possible connections and the significance of certain trends. But the work's getting easier: Open-data laws mean more and more information is now available while better metadata makes it easier to track down what's needed and to understand its significance.

The variety of data sources is growing too – national statistics, of course, but also data from international agencies and big data. The use of common standards means it's increasingly easy to combine data from different sources to tell more detailed stories. For the journalist, it all provides new opportunities to hold government and business to account – and to keep her editor happy.

OPPORTUNITIES OF THE DATA REVOLUTION:

ESTIMATING LITERACY RATES IN SENEGAL USING MOBILE PHONE DATA



Source: *Cookbook for a socio-demographic basket: Constructing key performance indicators with digital breadcrumbs*, Bruckschen, Schmid, and Zbiranski (2014).



ANNEX – METHODOLOGY

The recommendations in this report build on a programme of extensive background research in the form of reports and studies. These include a series of discussion papers, a study of statistical systems in 27 countries and a series of in-depth studies in seven countries.

The discussion paper series features expert authors ranging from statisticians to academics who seek to lend their voices to the discourse on statistical capacity development.

In-depth studies were conducted in seven countries: Bangladesh; Burundi; Cabo Verde; Colombia; Democratic Republic of Congo; Philippines; Trinidad and Tobago.

A cross-country study was carried out in three stages between May and September 2014. In Stage 1, a comprehensive database was compiled to include information on the structure, activities and outputs of statistical systems in all developing countries. Once this information was compiled, national statistical systems were divided into a small number of distinct groups with similar characteristics. Stage 2 involved a desk-study assessment of a sample of countries from each of the groups, involving 29 countries in total. Stage 3 involves in-depth investigation and analysis in seven countries, selected

from each of the groups identified in Stage 1. The selection of countries for the country studies was based on a stratified sample by countries' statistical capacity index and geographic regions. The statistical capacity index is based on the average capacity score for each of the six dimensions in the PARIS21 Metabase. Within each strata, countries were selected at random and non-respondents were replaced with a random draw from their respective strata.

The research programme was overseen by a technical review group of 15 experts from academia, statistical agencies, high profile think tanks and international donors. The role of the group was to coordinate and manage a quality control process of the different outputs and deliverables of the IDR project.

A comprehensive consultative process ensured that as many people as possible were involved in discussions about the data revolution, what it should do, who should be involved and how it should be put into action. It was essential to this process that the voice of developing countries was heard in this debate. To this end, PARIS21 organized country workshops in all countries selected for the in-depth studies and invited high-level representatives from the countries' statistical offices for a two-day workshop in Paris.



REFERENCES

- 1 OECD (2014), "Total Population", in OECD Factbook 2014: Economic, Environmental and Social Statistics, OECD Publishing, <http://dx.doi.org/10.1787/factbook-2014-1-en>
- 2 IBM (n.d.), "What is big data?", Big Data at the Speed of Business, www-01.ibm.com/software/data/bigdata/what-is-big-data.html
- 3 United Nations Children's Fund (2013), "Every Child's Birth Right: Inequities and trends in birth registration", UNICEF, New York, http://www.unicef.org/mena/MENA-Birth_Registration_report_low_res-01.pdf
- 4 Independent Expert Advisory Group on a Data Revolution for Sustainable Development (2014), "A World that Counts: Mobilising the Data Revolution for sustainable development", www.undatarevolution.org
- 5 Ibid
- 6 Round, J.I. (2014), "Assessing the demand and supply of statistics in the developing world: some critical factors", PARIS21 Discussion Paper Series, Discussion Paper No. 4, <http://paris21.org/sites/default/files/PARIS21-DiscussionPaper4-Demand.pdf>
- 7 For a presentation of the IDR project, see <http://datarevolution.paris21.org/the-project>
- 8 Evidence compiled during the IDR project.
- 9 Kiregyera, B. (2013), "Emerging Data Revolution in Africa. Strengthening the Statistics, Policy and Decision-making Chain", Sun Press.
- 10 PARIS21 NSDS Status Report 2014 <http://paris21.org/nsds-status>
- 11 PARIS21 evaluations <http://www.paris21.org/peer-reviews>
- 12 For example, see the 2013 evaluation of the International Household Survey Programme, www.ihsn.org/home/node/627
- 13 PARIS21 (2007), "Mainstreaming sectoral statistical systems in Africa: A guide to planning a coordinated national statistical system", <http://paris21.org/sites/default/files/intersect-final-en.pdf>
- 14 National partnerships have been promoted for countries participating in and benefitting from the Statistics for Results Facility managed by the World Bank, for example see www.worldbank.org/en/data/statistical-capacity-building/statistics-for-results-facility-catalytic-fund#4
- 15 Round, J.I. (2014), "Assessing the demand and supply of statistics in the developing world: some critical factors", PARIS21 Discussion Paper Series, Discussion Paper No. 4, <http://paris21.org/sites/default/files/PARIS21-DiscussionPaper4-Demand.pdf>

- 16 See <http://paris21.org/PRESS2013> for the latest Partnership Report on Support to Statistics.
- 17 Sustainable Development Solutions Network (2015, forthcoming), "A Needs Assessment for SDG Monitoring and Statistical Capacity Development: Developing a typology to assess the cost," Briefing Paper, SDSN in partnership with World Bank, Gates Foundation, PARIS21, CGD, Simon Frazer University and representatives from the IEAG.
- 18 Health Metrics Network (2012), "The case for investment in Civil Registration and Vital Statistics Systems" http://www.who.int/healthmetrics/resources/CRVS_investment_case.pdf
- 19 Sustainable Development Solutions Network (2015, forthcoming), "A Needs Assessment for SDG Monitoring and Statistical Capacity Development: Developing a typology to assess the cost," Briefing Paper, SDSN in partnership with World Bank, Gates Foundation, PARIS21, CGD, Simon Frazer University and representatives from the IEAG.
- 20 OECD (2014), "Development aid: Total official and private flows", Development: Key Tables From OECD, No. 5. DOI: <http://dx.doi.org/10.1787/aid-off-pvt-table-2014-1-en>
- 21 PARIS21 (n.d.), "Informing a Data Revolution, Cross-Country Study," http://datarevolution.paris21.org/sites/default/files/Country%20study%20write-up_sep%2022.pdf
- 22 PARIS21 (2007), "A Guide to Using a System-wide Approach to Implement National Strategies for the Development of Statistics (NSDS)," <http://paris21.org/sites/default/files/nsdswap-guide-en.pdf>
- 23 Jones, G. (2014), "Data Collection: Fresh from the market," 4 Sep., Financial Mail, Times Media (Pty) Ltd, Johannesburg, <http://www.financialmail.co.za/features/2014/09/04/data-collection-fresh-from-the-market>



COUNTRY STUDIES



The country studies were carried out in three stages between May and September 2014. In Stage 1, a comprehensive database was compiled to include information on the structure, activities and outputs of statistical systems in all developing countries. Once compiled, national statistical systems were divided into a small number of distinct groups with similar characteristics. Stage 2 involved a desk-study assessment of a sample of countries from each of the groups, involving 29 countries in total. Stage 3 involved in-depth investigation and analysis in seven countries, selected from each of the groups identified in Stage 1.

- Cross country studies
- In-depth studies

01010111100010100010101010101001010101000001011111111010101010101000100000100000010101000
0101010101010101010101100001010010101010101011111010101010101000100
000000101010001010001010101010010101011

THE ROAD MAP

2015 Establishing the baseline
and harnessing quick wins

CAPACITY AND RESOURCES

UPDATE NATIONAL STATISTICAL PLANS

- To align with post-2015 agenda and with development strategies.
- To identify opportunities for innovation and for partnerships.

MEASURE PROGRESS IN STATISTICS

Create a statistical capacity indicator within the SDGs framework and use PARIS21's Metabase (metabase.paris21.org/) to monitor it annually.

TALK TO USERS

Organise regular user-producer dialogues at country and regional levels.

PRINCIPLES & STANDARDS

PILOT DATA COMPACTS

A limited number of countries should sign a data compact with a few selected donors.

AGREE TO PLATFORMS AND STANDARDS

Set common technical platforms and standards to ensure faster data dissemination.

STRENGTHEN USE OF ADMINISTRATIVE DATA

Provide countries with technical support so they can start making better use of data derived from administrative processes.

TECHNOLOGY, INNOVATION & ANALYSIS

FEED THE INNOVATIONS INVENTORY

Regularly update and extend the PARIS21 Innovations Inventory (innovation.paris21.org).

TEST PUBLIC-PRIVATE PARTNERSHIPS

...such as the Orange Data for Development challenge and the Big Data Climate Challenge. Also, develop pilot projects to field-test innovations.

IMPROVE USER ACCESS

Upgrade national statistical web sites and establish data portals to improve user access to statistics.

GOVERNANCE & LEADERSHIP

CREATE FLAGSHIP REPORT ON DATA FOR DEVELOPMENT

Develop an annual Data for Sustainable Development Report, led by PARIS21, to examine ability of countries to measure SDGs and to report on funding for statistics.

IMPROVE MONITORING

Establish mechanisms to monitor the use of national standards and good practice throughout the national statistical system.

STRENGTHEN CO-ORDINATION

Countries should enhance national statistical agencies' coordinating role. They should also establish wide-ranging national partnerships for statistics.

2016–2020 Actions for the medium to long-term

2020 GOAL

ALL IDA COUNTRIES SHOULD HAVE INCREASED THEIR DOMESTIC SHARE OF FUNDING FOR NATIONAL STATISTICAL SYSTEMS.

STRENGTHEN STATISTICAL LITERACY

Improve levels of statistical literacy both among professionals in the statistical profession and – through education – the wider population.

RAISE STATUS OF PROFESSION

Recognise statistics as a profession within civil service and scale up salaries to attract strong candidates.

THINK REGIONALLY

Develop regional training tools; establish regional centres of excellence to share know-how.

2020 GOAL 60% OF IDA COUNTRIES SHOULD HAVE DOCUMENTED AND ARCHIVED THEIR DATA SETS AND SHOULD BE PROVIDING ONLINE AND CONFIDENTIAL ACCESS TO MICRO-DATA.

REVIEW LAWS

Review and revise statistical legislation to respond to emerging data needs, for example protection of confidentiality.

USE COMPLEMENTARY SOURCES

Put international standards in place to enable use of complementary statistical sources, such as big data.

2020 GOAL

40% OF IDA COUNTRIES SHOULD BE MAKING USE OF REMOTE DATA CAPTURE FOR LIVING STANDARD MEASUREMENT STUDY (LSMS)-TYPE SURVEYS.

LET COUNTRIES SET PRIORITIES

Ensure countries set the priorities for statistical R&D and that these drive the work of regional and international agencies.

OFFER INDEPENDENT ADVICE

Provide countries with independent advice on innovations. Also, ensure countries can use harmonized tools to facilitate data sharing.

ADOPT CORE INNOVATIONS

Core innovations should be identified for adoption by at least half of relevant countries within 5 years.

2020 GOAL

30% OF IDA COUNTRIES SHOULD HAVE MECHANISMS IN PLACE TO PROVIDE FOR AUTOMATIC DATA SHARING BETWEEN AGENCIES.

SECURE USER FEEDBACK

Strengthen mechanisms and processes for communicating with data users at country level.

IMPROVE DATA SHARING

Strengthen data sharing between national statistical agencies and international organisations, while respecting privacy concerns.

010101010100010000010101
010100010101010101001010101
010101010101010100
0101010101010010100000010111
0100001111101101110110101010
000101000101010100101010010
010111010101010111
0101110101010101010100101010
0101010101010101010101010101
00101010110111010110110101
0101101010001010101
01011010010100001011010101
01000101010101010011101010
01010101001
001010101001011101010101010
0101010100101001010
010010101010101010101010110
0101010100
010101010101011111010101010
00100000101000000101010101
010101010101010100101010010
01010101111101001
010101010010101010101010101
0100100001001001000100
001000101010001010110101010
11010101000010110101001010
010000001010101010101010101
010101001
001010111010101011111010011
0101010111010
01010101010101100001010101
001010101010101010111101
010100010101010101001010001
11010101010101001011010
01010101001010000001011111
001111101101110110101010100
010100010101010010101001
00101111010101010111
010111010101010101010010101
01010101010101010101
0101010100001010101101111010
01010111101011010101000101
001010110101001010000101101
010010100010101010101001
01010101010100101010010101
010111010101010101010
0101010010100101000010100101
0
0101010111110110111011010101
0100010100010101010010
00100100101111010101011111
01110101010101010101001010101
010101010101010101010101010
0010101011011110101101
0111101011010101000101010100
011010100101000010110
0101001010001010101010100111
010101010101001010100
01110101010111110
0101010101010010101010101010
0101100001010101010001010101
010101111
0100000101
0100100100 10
0111111010 00
010101010
0100101010010101110101010111
001101010101001111010
01010101010101100001010101
001010101010101011
01001010
011010000100000010
000101000101010101001

