Report

Country priorities for data development:

What does history tell us?

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Key messages

- To get an alternative view on what national governments need to prioritize to formulate effective policies, plan and implement service delivery, and monitor progress, we focus in this report on the development of statistical systems in a handful of countries that have invested significantly in building such systems, to both serve their own needs as well as those of the international development community.
- South Africa's experience illustrates the critical importance of the census as the bedrock of a national data system and the core of a nation-building effort that is based around the state as a provider of services. This calls for greater prioritisation of censuses and civil registration and the collection of vital statistics. Pakistan's experience highlights the need to create a single statistical entity as opposed to several different ones. Mexico's experience underscores the need for NSOs to be autonomous as well as for strengthening their capacity to coordinate and innovate.
- Neither governments nor donors should underestimate the time it takes to build effective statistical capacity: in Pakistan it took 51 years.

Acknowledgements

The authors would like to extend their gratitude to external reviewers Graham Eele (independent consultant) and Morton Jerven (Simon Fraser University) for their detailed and helpful comments to an earlier draft. The authors would also like to thank ODI colleagues Claire Melamed and Emma Samman for their feedback.

The authors are grateful for the contribution of Jeffery Round (University of Warwick) who provided a background paper this study draws on.

Ben Tritton managed layout and production.

The usual disclaimers apply.

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Abbreviations

CWIQ	Core Welfare Indicators Questionnaire
DECDG	Development Data Group
GDDS	General Data Dissemination System
INEGI	National Institute for Geography and Statistics
LISGIS	Liberia Institute of Statistics and Geo-Information Services
LSMS	Living Standards Measurement Survey
MICS	Multiple Indicators Cluster Survey
NSO	National Statistical Office
NSS	National Statistical System
PBS	Pakistan Bureau of Statistics
SCI	Statistical Capacity Indicator

Executive summary

While donors are currently invaluable partners for effective data collection in developing countries, there is a clear danger that national strategies to improve statistical capacity are driven by their interests rather than domestic ones.

In a bid to make this less likely, and at a time when the development of the Sustainable Development Goals (SDGs) is driving consideration of how a data revolution can deliver significant improvements to poor countries' statistical capacity, we ask the question: *what are country priorities and how should they condition donor investments in statistics?* We explore in some depth the evolution of statistical systems in three middle-income countries that have built statistical capacity over time – South Africa, Pakistan, and Mexico – to capture the key lessons from their respective experiences.

In the case of all three countries, while the drivers for data collection may well have been a combination of global and domestic demands and priorities, over time the statistical agencies in these countries have themselves driven remarkable change.

In South Africa, in the most political context possible – the ending of apartheid – the 1996 Census emerged as the bedrock of a national data system and the core of a nation-building effort that is based around the state as a provider of services. In Pakistan, the consolidation of statistical activity under a single entity has helped improve operations. Mexico has demonstrated the importance of constant adaptation; innovations with the integration of different sources of data; and the decentralisation of certain technical and political aspects of the system. The need for making NSOs autonomous and independent as well as for strengthening their capacity to coordinate is also clear in the case studies. We also trace the major turning points in global and national level data collection and find two distinct but related dynamics at play – one relates to the choices that drive what types of data are collected, and the second to the choices that drive how those data are collected and reported.

At the global level, the drivers historically have been: the transition from colonial to post-colonial rule; the focus of the international community on growth, necessitating the collection of economic data; the importance of collecting social statistics and according living standards much greater importance; adopting a principled approach to data collection and dissemination; monitoring international goals as well as the impact of donor-funded programmes; and more recently, the emphasis on data for sustainable and inclusive development.

At the country level, the drivers have been influenced by the state's choices to control populations and territory, to access rents, to exclude or include certain groups, to promote public administration or maladministration, as well as to justify certain policies.

We end by highlighting the lessons for developing country statistical offices in general, and for national statistical offices (NSOs) in particular. And by drawing on the best lessons from these cases, as well from their own interactions with countries, donors can also rethink their engagement strategy for the future. Their critical role as major sources of funding and as facilitators of greater collection and dissemination of socio-economic data and of statistical capacity-building needs to be balanced with the recognition that their behaviour can become problematic for NSOs, that their inclination towards certain types of data may not be entirely beneficial for the countries in question, and that the lack of coordination amongst themselves can trump the many benefits they bring to countries.

Donors need to step up their efforts and align their investments with country needs and priorities. They also need to reflect on the nature and scale of commitments they are prepared and willing to make.

Finally governments and donors alike need to step up their investments to ensure that no one is left uncounted, and therefore left behind.

1 Introduction

Data are critical for measuring and delivering the Sustainable Development Goals (SDGs) at national and global levels. Understanding the institutional arrangements through which data are produced and consumed is therefore vital, as governments start to think about how to implement the SDGs successfully and, in particular, how to ensure that progress leaves no one behind.

Research is already underway to identify gaps in existing data and in existing national statistical systems.[1] The list of needs that possible new funding could fill will be very long, meaning that it is vital for governments – and donors – to prioritise them. The Sustainable Development Solutions Network (SDSN) suggests it will require an investment of $1billion a year globally to improve national statistical systems for measuring progress on the SDGs (Espey et al, 2015). Priorities for spending this will vary by country and by sector, and it is important that whatever mechanisms are set up to invest any new resources – technical and financial – are informed by country-specific needs and priorities. Yet however nuanced the programmes in each country, there remains a risk that its needs and priorities will be overshadowed by donor priorities and by the demands of international monitoring.

In order to get an alternative view on priorities and demands from the perspective of what national governments need to formulate effective policies, plan and implement service delivery, and monitor progress, we focus in this report on the development of statistical systems in a handful of countries that have invested significantly in building such systems, to both serve their own needs as well as those of the international development community. The objective is to get a better picture of how these priorities have emerged and of the political choices that have informed the systems that exist today. An important part of this research is dedicated to national statistical offices (NSOs) and how they serve dual functions of helping governments to formulate policies and enabling the populace to hold those governments to account.

The overarching research question this report aims to answer is: *what are country priorities and how should they condition donor investments in statistics?* We look at the experiences of South Africa, Pakistan and Mexico. All three have advanced statistical systems.[2] And although all three are middle-income countries (MICS, and therefore receive relatively less donor assistance), their motivations and mechanisms for statistical reform are useful to explore as potential pathways for current low-income countries, as well as for other, less statistically-advanced MICS, and for donors.

The methodology for the report entails desk-based research, including a review of the literature on statistical systems, other available material on the three case studies, as well as key informant interviews. The report is envisioned as a platform for future

[1] For example the data2x initiative to fill the gaps on gender-disaggregated data to improve policy making. See http://data2x.org/

[2] All three countries score highly on the World Bank's (DECDG) Statistical Capacity Indicator (SCI). Scores for 2014 were: South Africa (74.4), Pakistan (74.4), and Mexico (85.6).

in-country case studies that will probe in greater depth the demand for data – to respond to national priorities as well as international standards.

2 Background

2.1 Global drivers

In this section, we give an overview of when and how data collection – especially official statistics – evolved, and the role of donors in initiating changes to explain where we are at and, at least in part, where we are headed in the SDG implementation era. Changes occurred in both the types of data collected, and the methodologies and techniques used to collect and process that data.

The major turning points at the global level included:

- the transition from colonial to post-colonial rule;
- the focus of the international community on growth, necessitating the collection of economic data;
- the importance of collecting social statistics and according living standards much greater importance;
- adopting a principled approach to data collection and dissemination as articulated in the Fundamental Principles of Official Statistics[3];
- with monitoring international goals such as the Millennium Development Goals (MDGs) as well as the impact of donor-funded programmes; and
- the more recent emphasis on data for sustainable and inclusive development (e.g. collecting data on environmental aspects, subjective wellbeing, multidimensional poverty, etc.)

2.1.1 National Statistics pre-1945

In the colonial era, data were collected for revenue-raising purposes (i.e. tax), to deliver public services, and, in a broad sense, to formulate policy in the colonies (Edmunds and Marchant, 2008). Key data collection during this time centred on agricultural and demographic statistics. Many African nations and other former colonies then continued to follow this pattern after independence.

2.1.2 Post-1945

In the post-1945 era there was a greater emphasis on economic statistics, accompanied by dedicated surveys and a smaller reliance on administrative records (Trewin, 2007). National accounts, consolidating many economic statistics, were a post-1945 phenomenon in much of the industrialised world. Early examples of the construction of national accounts for developing economies appeared in the 1950s and, more commonly, during the 1960s: in line with a Keynesian approach[4], national income and product estimates were aggregated to support the objective of economic

[3] These principles were first adopted by the United Nations Statistical Commission in 1994 and more recently endorsed by the UN General Assembly in 2014.

[4] Keynesian economics refers to the emphasis on demand management in economic policy: aggregate demand being the driver for determining output (and hence economic growth) coupled with an interest in economic structure to determine its impact on sectors of production.

growth. Social statistics were rarely gathered in developing countries because there was very little policy demand for them.

2.1.3 Post-1973

The early 1970s witnessed a marked shift to include social statistics via new household survey initiatives, such as the United Nations Household Survey Capability Program (UNHSCP), and the World Fertility Survey. However, it was not until Robert McNamara became President of the World Bank that the focus in development shifted from growth per se and towards targeted poverty reduction and distributional issues[5] (McNamara, 1973). In turn this precipitated a whole new activity in data collection.

The Living Standards Measurement Survey (LSMS), introduced in 1983 and still a major data initiative of the World Bank, working in partnership with individual country NSOs, represented a major break with tradition in household surveys. It included a broad range of topics, going far beyond the household budget and income surveys that had been the norm until then.

Another major initiative in this period included the Demographic and Health Surveys (funded by USAID and initiated in 1984).

2.1.4 Post-1990 and the MDGs

This period marked a shift towards demand for frequent data to inform planning. The Social Dimensions of Adjustment (SDA) Priority Surveys and Core Welfare Indicators Questionnaire (CWIQ) (carried out by the World Bank) were initiated in 1991 and aimed to gain a rapid sense of people's access to services. The Multiple Indicator Cluster Surveys (MICS) programme (carried out by the United Nations Children's Fund, UNICEF) started in 1995 and in the same year, the International Monetary Fund (IMF) initiated the General Data Dissemination System (GDDS) to guide members in establishing data dissemination standards in: data coverage, periodicity, and timeliness (IMF, 2015).

The MDGs, introduced in 2000, were instrumental in strengthening statistical systems, both at national and international levels, in order to generate the data necessary to monitor the goals. Poverty reduction was set as a central priority in the MDGs (MDG1) and the necessary data were to come mainly from household surveys.

In parallel but by way of their own reorientation to development assistance, the IMF and the World Bank also created a programme of Poverty Reduction Strategy Papers (PRSPs) in the early 2000s to achieve country-driven goals and to focus on results-based monitoring and evaluation of their interventions. This again required significant amounts of additional data from NSOs.

2.2 National drivers

In addition to these major turning points at global level, country level developments in data collection were driven by many factors. The methodologies used for collecting data and the focus of statistical systems shifted in tandem with economic,

[5] See McNamara (1973) 'The Nairobi Speech', an Address to the World Bank Board of Governors, Nairobi, Kenya, September 24, 1973.

social and political transformations in the countries. Two distinct dynamics were at play. At one level, as identified in the preceding sub-section, the dynamics related closely with ***what*** types of data were to be collected. At another level, the dynamics underpinned incentives for the state to influence ***how*** data were to be collected and reported. We first discuss below the needs of governments to drive what data were collected on territories, sectors, and people. We then discuss the incentives to distort or differently interpret the collection and reporting of data.

2.2.1 Control over populations and territory

At the highest level governments use the collection of statistics to exert control over populations and territory. The evolution of census data in Europe focused on enumeration of the population to allow for conscription, and the mapping of economic activity and wealth to allow adequate taxation. These basic priorities of enumeration and taxation are still major elements of state motivations for data collection and the nature of the political system has a direct impact on the focus and quality of data collection.

2.2.2 Rent seeking

Countries with predatory but centralised rent-seeking are likely to have detailed data on the sectors that are major sources of rent to facilitate greater control over these resources. Where rent-seeking is not centralised, figures on key sectors are more likely to be misreported in order to conceal this from the public and other political actors, and the low capacity of statistical agencies may mean this is not picked up. In contrast, countries in which rent seeking is more broadly based, or where long-term growth is prioritised, are more likely to see broader investments in statistics in order to allow better planning for both the growth and distribution of wealth (Krätke and Byiers, 2014).

A rough example can be seen with the centralisation of many African economies in the 1970s. Here the evolution of parastatal companies and marketing boards that controlled much of the economies allowed elites access to rents. This was accompanied by considerable improvements in data collection on a range of economic sectors, driven by information held by parastatal enterprises and marketing boards. This was then followed by a rapid decline in the quantity and quality of data during the 1980s as structural adjustment reforms saw many of these bodies dismantled and considerable growth in the informal economy (Jerven, 2012).

Post-colonial Ghana provides an interesting example of how rent seeking priorities and prevailing ideologies can shape statistical strategies. In this case the phenomenon of urban bias – where urban areas were seen as the drivers of development and where urban populations were the centre of political support for post-colonial elites resulting in diversion of resources from rural areas – appears to have shaped the nature and form of data collection. During the early post-colonial period household budget surveys were used extensively in rural regions, despite their high costs in terms of personnel, in order for the government to penetrate the countryside as well as to gain information on high value economic sectors (i.e. cocoa production). Surveys of cocoa-producing areas had a much stronger focus on collecting farmers' income and debt levels in comparison to other areas. This not only allowed the government to accurately gauge the size of the sector, information that helped to facilitate rent-seeking in the form of diverting resources to urban regions, but also emphasised the dependence of these farmers on credit from the state, providing a political justification for high taxation of the sector (Serra, 2013).

2.2.3 Social exclusion and elite capture

Census data and the collecting of statistics on populations can also have a range of powerful impacts on social exclusion (and inclusion) by creating official individual identities and recognising particular groups as being real and legitimate in the eyes of the state. For example, in many states an official identity in the form of an identity card, presence on an electoral role, or a birth certificate, are basic pre-requisites for access to civic rights and duties such as voting, legitimate property ownership and social services or welfare.

Where citizens are not automatically registered this creates exclusion and limits the social responsibilities of the state to these citizens, while at the same removing these groups' access to legitimate representation. Post-colonial Nigeria provides an interesting example of this. Colonial censuses were limited in scope and enumeration was particularly challenging in the north and south-east of the country, resulting in estimates from tax records being used for these areas and leading to considerable underestimations of population.

When the first post-colonial census was released in 1962 enumeration improved considerably and the recorded population rose in both the north and south, leading to the balance of political power becoming heavily contested as these regions appeared to have been under-represented. The government responded by rejecting the census and commissioning another census the following year. Both the 1963 Census and the 1973 Census were rejected and considered illegitimate, particularly by southern politicians, and the military authorities ruling Nigeria in the 1980s decided not to conduct a census in that decade.

The issue has remained contentious into the present day. Ahead of the 2006 census a Census Awareness Study indicated that almost a third of the population would not trust the census result, despite rigorous preparations being made (Jerven, 2012).

It is notable in this regard that only 60 countries have completed vital registration, a process that requires systems for data collection at local level and so an embedded presence of the state, and that none of them are in Africa (Glassman and Ezeh, 2014). If this form of exclusion systematically favours certain groups then it may persist as a mechanism for these elite groups to maintain their influence.

Apartheid South Africa provides an interesting example of these dynamics, as before the end of apartheid national censuses were rare. The 1996 Census was a major political event in terms of ensuring that all South Africans were fully recognised as citizens, regardless of race, and the inclusion of social statistics for the first time demonstrated strongly the inequities the apartheid system had caused.

In other contexts, the collection of statistics that categorises citizens by ethnicity, religion or caste can highlight grievances and allow government revenues and aid to be targeted to specific groups – at the same time cementing these groups as identities that are more able to organise and act collectively. However, there may also be perverse effects in that identification of certain groups may allow the state, and others, to target them to their detriment (see the discussion of the treatment of Rohingya people in the recent Myanmar census in Stuart et al, 2015).

The collection of data is therefore an intensely political act – allowing states to create and recognise identities for political purposes and in turn allowing groups to seek recognition, organise and make demands. For example, data collected on maternal mortality rates overall may show improvements, but if these data also record

women's ethnicity or caste they may show differential rates that demonstrate favoured or neglected constituencies. Access to these figures can then hold significant political advantages – allowing the concealing or revelation of political targeting and the counter-mobilisation of excluded groups. Who is counted and how they are counted are therefore extremely important.

2.2.4 Public administration and maladministration

The basic running of state institutions also requires the generation of data. Simple examples include lists of employees in police forces, schools or hospitals; the number of pupils in particular schools; or the number of prescriptions for medicines coming from a health centre. In many cases, these are to allow funds to be channelled to these entities – to cover wages, funds for student schooling or to reimburse for medicine costs.

These figures can provide elements of social indicators by allowing, for example, calculation of doctors per head of population or student drop-out rates. These are also areas of statistics where states may have a strong incentive to try to ensure accuracy in order to exert control over lower levels of the bureaucracy and ensure funds are not wasted.

Investing in these administrative systems of data collection may also have the effect of strengthening institutions and their ability to deliver public services (as well as vice versa).

However, where the state has little discipline or statistical capacity to check figures, or where social sectors are also used as sources of rents, there may be incentives for these forms of data to be falsified. Sandefur and Glassman (2014) find empirical evidence for these dynamics, noting that data on changes in primary school enrolment rates are over-estimated by roughly a third in African administrative data, a bias that is not found in other regions. This means that one in three of new students registered in schools during this period was a data ghost – existing in the classroom only on paper. Examining more detailed country datasets (in Kenya and Rwanda) at the point of shifting from user fee based financing to capitation grants (i.e. state per pupil payment to schools) saw these gaps widening following the shift. Essentially it seems local administrators were responding to the new arrangements by inflating their student numbers to secure more funding for their area.

Strengthening these systems may therefore be a political priority where governments are looking to exert greater central control over line ministries, public services (particularly at local level) and sub-national government. However, they may conversely be opposed if powerful groups are using these over-estimations as sources of rents to channel resources to particular areas or allow them to run patronage networks by providing their political allies access to these resources.

This latter factor can also be a challenge for national statistical offices seeking to compile data on sectors from other ministries or to collect parallel statistics. While this process can be seen as a useful check of robustness and consistency it may be seen as threatening to the ministry involved, which may interpret it as a hostile investigation of potential corruption or an attempt to secure influence in an area. Strong political support may therefore be needed to overcome opposition from line ministries and allow the national statistical office to collect or compile the data. Mexico provides an interesting example, explored further below, where strong central political momentum facilitated the national statistical office in setting standards for data collection.

2.2.5 Policy justification

There may be political advantages in allowing the most favourable statistics for the government's agenda to be published. Jerven (2014) notes this in the case of Nigeria in the late 1980s, where there were a series of conflicting datasets in terms of agricultural production following the removal of fertiliser subsidies, with the government eventually choosing one and rationalising the reinstating of subsidies on the basis of it. Policy here was justified by evidence, but the reverse decision could have equally been made with similarly robust statistical support. This is a relatively subtle form of manipulation, however, and there are examples where states have either actively manipulated statistics for political ends to justify political priorities – in the fertiliser subsidy programmes in both India and Malawi (Jerven, 2014) – and access to international funding – in the case of various sub-Saharan African countries in relation to the Global Alliance for Vaccines and Immunisation (GAVI) payments for vaccinations (Sandefur and Glassman, 2014).

The collection, design, usage and publication of statistics need to be viewed in relation to their capacity to benefit different groups: governments, political parties, ethnic blocs, rival ministries or rent seekers at all levels of society. Given this, it is unsurprising that statistical reform is both difficult and contentious, particularly when treated as a straightforward technical fix.

3 Country experiences

In this section, we highlight some key lessons that have emerged from the experiences of South Africa, Pakistan and Mexico in statistical reform as well as from our in-depth interviews with current heads and directors of NSOs. These lessons can help in the design of donor investments as well as country level action in statistical development.

- South Africa's experience illustrates the critical importance of the census as the bedrock of a national data system and the core of a nation-building effort that is based around the state as a provider of services. This calls for greater prioritisation of censuses and civil registration and the collection of vital statistics.
- Pakistan's experience highlights the need to create a single statistical entity as opposed to several different ones.
- Mexico's experience underscores the need for NSOs to be autonomous as well as for strengthening their capacity to coordinate and innovate.

3.1 South Africa

3.1.1 Lessons from the past

The connection between broader politics and statistics is nowhere clearer than in South Africa. Prior to 1994 (during apartheid), the Homeland Statistics Act defined the national approach to statistics. Pali Lehohla, Statistician General of Statistics South Africa (since 2000), described this as the: 'hallmarks of a racist approach to life…The data were woefully deficient. Economic statistics were available - albeit with a considerable time lag; there was very little on social statistics' (Lehohla interview, 2015). He says:

> *In the absence of a national system focusing on the total population, the stage was set for the fragmentation of statistics in their thematic and spatial representation. This fragmentation included the institutional basis for producing statistics, and was directly linked to the requirements of apartheid governance. To the extent that those excluded from access to power and resources appeared in the official statistics, it was as objects of policy, for purposes of control and the geographical fragmentation that underlay apartheid (Lehohla, 2005:48).*

While serving as demographer at the Bophuthatswana Statistics Office[6] (a state level statistics office in South Africa) during apartheid, Lehohla was tasked with conducting a Homeland Census of 1.5 million people. The many challenges to confront at the time were:

[6] Bophuthatswana Statistics Office is a state level statistics office in South Africa.

- the tendency of 'independent' state-level offices to take 'marching orders' from Pretoria, where the Central Statistical Services (CSS) was housed;
- the absence of disaggregated data as part of mainstream thinking and the unwillingness on the part of the CSS to process a comprehensive questionnaire for the census;
- improper coding design to transfer data collected in the field onto statistical software; as well as
- the lack of exposure of staff to conduct large scale surveys and censuses (Lehohla interview, 2015).

The 1996 Census marked in a way like no other the intimate connection between statistics and politics. The results of the 1996 Census gave Nelson Mandela - then newly elected as President – for the first time, a full portrait of a nation (Mandela, 1998). In an official address after the count, he said: 'We do at last have results with which we can work, numbers that count for the nation,' (ibid). The disparities between whites and non-whites, as captured credibly in the official numbers for the very first time, were powerful: 'The results remind us that we have only started along the path towards that goal which was at the heart of our nation's founding consensus: namely, to overcome together the legacy of our divided past,' (ibid).

The post-apartheid era had implications not only for politics, but also for statistics. Broader political transformation meant that the system of data collection needed to change. The national statistical office needed to be reorganised, but Lehohla says: 'Many players in the system were not willing to surrender their space…being a statistician was the least important part of my job – it had been entirely political,' (Lehohla interview, 2015). Building long-term alliances and placing the right people at the right time to transform the national statistics office was both a challenge and an opportunity. The modernisation of the national statistical office was brought about by certain landmark efforts, chief among which was the 1996 Census. With each iteration since 1996, the system of nationwide data collection has improved (Lehohla, 2005).

In 1999, a new Statistics Act was passed to include the black population in all official statistics. The duties and powers of the Minister of Finance, the Statistician General and the Statistics Council are now clearly articulated in the current legislation.

3.1.2 Lessons from current strategies

One clear lesson for the country's NSO came from a debacle over the formation of the country's Consumer Price Index (CPI) in 2003. The NSO had overestimated the rate of increase in the housing rental component in the CPI, which in turn led it to overestimate inflation. The NSO was questioned from all sides: government, the media, investment analysts, economists (Lehohla, 2005), and risked losing credibility. It acknowledged that there were errors in the data and found the source of these errors to be 'methodologically faulty imputations' (ibid). The data on which CPI adjustments were meant to be based were from the household survey that had been discontinued in 1999, as 'the funds had dried out,' (Lehohla interview, 2015). 'The consequences of these unsound imputations and projections had not been properly identified, largely because of the absence of skilled analytical capacity in the agency,' (Lehohla, 2005). As Lehohla says: 'It was a very expensive mistake because people bought inflation-linked bonds,' (Lehohla interview, 2015).

The need to enhance staff capacity had therefore been recognised. Over time training programmes have been designed to improve staff competencies. Links with the

University of Pretoria and the University of Stellenbosch as well as connections to regional planners have brought many opportunities to develop staff skills that are fit for purpose (Lehohla interview, 2015).

Currently, the agency is taking advantage of efficiency gains. It releases data regularly in the public domain, and has highly sophisticated and user-friendly apps to do so (Lehohla interview, 2015). However, this means that newer legislation needs to reflect emergent relationships between the producers and users of statistics. For example, NSOs need to be able to access passive data that the private sector collects. Some of these data are part of the commons but also have implications for the security and safety of citizen information. Lehohla says: 'We need a strong compliance regime that needs to be enforced by law and professional practice…protocols of use of the new sources of data being collected by the private sector need to be clearly defined,' (ibid).

In many ways the SDGs are the right engine for mobilising statistical transformation (Lehohla, interview, 2015). The data revolution also highlights the greater need of NSOs to access tools and software that enable better storage, higher speed of retrieval, sophisticated analysis and dissemination of data (ibid).

3.2 Pakistan

3.2.1 Lessons from the past

In 1950, the Government of Pakistan established the Central Statistical Office (CSO) as part of its Economic Affairs Division (PBS, 2015).

In the early 1960s, the United States Agency for International Development (USAID) helped Pakistan collect agricultural statistics, mainly to capture the benefits from the Green Revolution. USAID also helped with setting up a System of National Accounts (SNA) during this time (Bajwa interview, 2015).

In 1973, on the recommendation of the International Bureau of Reconstruction and Development (IBRD) mission, the CSO was upgraded into a Statistics Division within government. The main entities attached to the Division included the Federal Bureau of Statistics (FBS); the Population Census Organization (PCO); and the Agricultural Census Organization (ACO).The General Statistics Act was passed shortly after in 1975 (PBS, 2015).

There were major improvements in data collection from the late 1990s and in the early part of the 2000s. At that time, donors were particularly active in setting up a regular system of Pakistan Social and Living Standards Measurement (PSLM) Surveys and Household Income and Expenditure Surveys (HIES), and also helped with the 1998 Population Census (World Bank staff interview, 2015).

In recent years, Pakistan has embarked upon a process to consolidate all statistical operations. Through the General Statistics Reorganization Act (2011), the Pakistan Bureau of Statistics has been created to subsume all three entities cited above. Efforts to eliminate duplication along with improving coordination were motivating factors for this change (Bajwa interview, 2015).

3.2.2 Lessons from current strategies

Building efficiencies into the system were part of restructuring the law in 2011. The enumerators working separately in the three entities now work together across the

various censuses and surveys. The enumeration blocks which were separate for all three have also been merged, making the sampling frame for all three identical, hence making analysis of the data much easier and more efficient. Some efforts have been taken to digitize enumeration blocks using Global Positioning System (GPS) coordinates and the aim is to create detailed digital maps of all enumeration blocks by 2016 (Bajwa interview, 2015).

The Pakistan Bureau of Statistics is keen to collect data for the SDGs in-house[7] (Bajwa interview, 2015). The Chief Statistician, Asif Bajwa, states that: 'The NSO is highly important as a provider of quality data,' (ibid). He adds that there is significant demand for data, from government, but also from researchers, donors, and a relatively free media - both print and electronic. Bajwa says that across these diverse groups the gaps in knowledge are being filled by the data. But the evidence base, especially to calculate official poverty estimates from nationwide HIES have come under increasing scrutiny in the country (Khan et al, 2015). Data quality has surfaced as a major problem because of outdated sampling frames (World Bank staff interview, 2015), although a population census is in the pipeline for 2016 and the funds have already been ear-marked (Bajwa interview, 2015).

The Pakistan Bureau of Statistics relies mainly on traditional methods of data collection: 'The mainstay of statistical activity are the people,' (Bajwa interview, 2015). But some systems of data collection involve a hybrid: for some programmes such as measuring tobacco use for the World Health Organisation, enumerators use hand-held devices to collect data. Other more advanced technologies are not being scaled up mainly because of the difficulties of authenticating data. 'Sometimes handheld devices cause major logistical nightmares…there is not enough electricity for hand held devices to work properly when the enumerators are out in the field,' (ibid).

The prospects of leaving no one behind are promising in Pakistan in that most of the country's population has been mainstreamed in the national database (Bajwa interview, 2015). All citizens need to hold a Computerised National Identity Card issued by the National Database Registration Authority (NADRA). With this card, poor people can access social safety nets e.g. cash transfers for income support through the Benazir Income Support Programme (BISP), the largest social protection scheme in the country as well as for coping with recurrent disasters and conflicts (ibid).

3.3 Mexico

3.3.1 Lessons from the past

Mexico's main statistical agency, the National Institute for Geography and Statistics (INEGI) was founded in 1983 on the basis of a 1980 law on Statistical and Geographical Information (LIEG). It is the latest in a long evolution of statistical offices - the first, the General Directorate of Statistics, founded in 1882 - that have reported to different ministries as the government has been re-organised (INEGI staff interviews, 2015).

There was, however, a growing recognition that the LIEG needed to reflect technical developments as well as the changing country reality. Calvillo-Vives (2007) notes that reforms were needed to establish the credibility of key statistical information in

[7] See the incumbent government's Vision 2025 document that is aligned largely with the proposed goals.

a new democratic era, following a long period of single-party rule characterised by a strong presidency – and the accompanying perception that the government had manipulated data for its own ends. The issue began to surface in the legislative agenda in 1996 and at least six legislative initiatives were submitted to Congress over the next 12 years before INEGI became autonomous. The length of the process was partly a function of the need for a constitutional amendment, in that it required considerable support for the changes across parties in both houses. An initiative was approved by the Senate in late 2003 that had the backing of all parties, but the need for further changes meant that the constitutional reform was only agreed in late 2006 with the statutory law establishing the agency taking two more years (Calvillo-Vives, 2007).

In 2008, the Law of National Statistics and Geographic Information (LSNIEG) accorded INEGI technical and management autonomy, as well as responsibilities to regulate and coordinate the national statistical system.

Calvillo-Villes (2007) also notes that this was part of a broader alteration in the structure of the state that saw a range of other agencies that exercise key strategic functions (e.g. the Central Bank, Federal Elections Institute and Federal Chief Auditor) also being made autonomous.

The legislation adopted uses a decentralised architecture for the statistical system that empowers ministries to put in place information systems in their areas of jurisdiction, for instance the Ministry of Health is responsible for building a National System of Health Information. A key role for INEGI is therefore coordination across a range of information providers, with the constitutional amendment strengthening its role and extending its influence from the national level to the state and municipal level. The over-arching statistical system is therefore the product of three sub-systems that are coordinated by INEGI and whose indicators and methodologies are agreed by the INEGI Board: economic and financial statistics; social and demographic statistics; and environmental and geographical information (Calvillo-Villes, 2007).

3.3.2 Lessons from current strategies

INEGI's autonomy allows new configurations of relationships among information producers. The new law creates synergies across institutions, for instance through thematic technical committees; capacity building of other producers to consolidate the national statistical system; reviewing and standardising methodologies in the production of information of national interest; as well as offering a range of options for staff development (INEGI staff interviews, 2015).

The push to collect national crime statistics in the mid-2000s saw INEGI create a series of new surveys, but also involved considerable coordination with different agencies - e.g. the police, courts and prosecutors - to collect the data produced by these agencies, to standardise this data, and to conduct internal censuses in these agencies to track resources, personnel, functions and results. INEGI was therefore only one element in the creation of these new datasets and its role in coordination was also as important as its collection of actual data (see Rojo, 2014).

Mexico has also been moving from data collection based on direct interviews with paper-based questionnaires to interviews using electronic devices. Some examples worth noting include:

- The 2014 Economic Census was carried out through direct interviews with electronic tablets for most economic units;[8]
- Data for the National Census of Schools, Teachers and Students of Basic and Special Education (CEMABE), carried out in 2013 by instructions of the Federal Executive, were collected entirely with electronic tablets;
- The National Survey of Victimisation and Perception of Public Safety (ENVIPE), the National Survey of Social Cohesion for the Prevention of Violence and Crime (ECOPRED) and the National Survey on Demographic Dynamics (ENADID), among others, have combined direct interviews with mobile computing devices or mini-laptops;
- In the case of economic surveys, respondents are provided with options to submit answers securely online. Computer-assisted interviews for some respondents who prefer to speak with representatives of INEGI have also been introduced (INEGI staff interviews, 2015).

Mexico is also making use of innovative data sources in measuring subjective well-being and using satellite GIS data in coordinating a range of government functions (PARIS21, 2013a).

Census and inter-census survey sample design in Mexico is relatively comprehensive as data are collected on subgroups – such as the homeless, the disabled, the mentally ill, those who live in collective housings, ethnic minorities or nomads – at national level. However they are not disaggregated to state and municipal levels. The 2010 Census and the inter-census surveys in recent years have factored this into sample designs. As a result, for municipalities, which according to the Human Development Index and the Ministry of Social Development's indicators, are less developed, many – but not all – excluded groups are now being counted. Homeless people remain left out of the count (INEGI staff interviews, 2015).

[8] However, for those economic units considered large and for certain sectors of the economy other alternatives were used to obtain the information from respondents: self-registrations through the internet to fill in electronic questionnaires.

Box 1: Leaving no one behind in national data collection efforts

In spite of the extensive and widespread data collection efforts of recent decades to track the well-being and conditions of populations, several recent papers have highlighted the fact that there are millions of people who are missing from (or unrepresented in) datasets and who, therefore, are probably unaccounted for in policy initiatives based on these data.

This is a serious problem because there is evidence to suggest that the 'missing millions' may disproportionately represent the poorest and most vulnerable members of society – in other words, the people who are left furthest behind.

Carr-Hill (2013) pointed out that two categories of households are typically omitted or under-represented in household surveys:

- By design – the homeless; those in institutions; and itinerants or pastoralists;
- In practice – people living in fragile areas that represent a security risk and slum populations.

These categories of households are likely to 'constitute a large fraction of the *poorest of the poor*' – in other words, the very people who are being most left behind, the lives of whom the Sustainable Development Goals are explicitly aiming to improve. Carr-Hill (2013) concludes that household surveys under-report the poor and underestimate the extent and depth of poverty – in all its manifestations.

Some potential ways that NSOs could fill these data gaps, and count the missing millions include:

- Harnessing the use of new technology in data gathering, to complement survey results. Some developing countries already use satellite data to track proxy poverty levels for example;
- Using data from non-official sources such as NGOs and community groups; and
- Oversampling to find people who are suffering from multiple forms of disadvantage (for example disabled people living in rural areas).

Source: Carr-Hill (2013) and Stuart et al (2015)

4 Designing donor interventions

In addition to emergent lessons from country experiences, lessons can also be drawn from donor interventions in national statistical capacity in different contexts.

Donor behaviour can itself be problematic for NSOs for a variety of reasons. First, frustrated by the lack of domestically-generated data or by data not relevant to address their monitoring and evaluation or ad-hoc research needs, donors commission surveys that do not necessarily produce data that are of use to the government or national stakeholders – although they can serve to highlight data gaps. In doing so, they may undermine the already stretched capacity of NSO staff, who are hired to conduct the donor surveys on a consultancy basis (Stuart et al, 2015).

Next, development partners tend to fund programmes that may be more likely to succeed, but may not be where the gaps are greatest. In Liberia, where the need for donor assistance is most acute with agricultural surveys, donors have been reluctant to fund the agricultural crop surveys (of 2008, 2009, 2010 and 2011, which were government funded), in part because technical capacity is lowest in this area. Currently such surveys, where a crop-cut method is used to measure production of staples rice and cassava, are riddled with difficulties: farmers have very low literacy levels, sample selection methods are poor, and there is a lack of randomisation in the selection of crop cutting plots (personal interview, 2015). Indeed, there are many technical and logistical difficulties in implementing a quality agricultural survey in the country. There is a very short window of time when the survey can be conducted, for instance, so having agricultural expertise to plan a robust survey is very important.

The NSO in Liberia, the Liberia Institute of Statistics and Geo-Information Services (LISGIS) is now attempting to bring in proper randomisation in crop-cutting, and to supplement the information with farmer recall (personal interview, 2015). Donor support in these areas would clearly be helpful.

Third, in the past donors have not coordinated sufficiently well their sponsored internationally-comparable household surveys, resulting in more than one such survey being conducted in the same year in some instances (Stuart et al, 2015).[9] They have also failed to observe the principles of the Paris Declaration that called for greater harmonisation of development assistance across the donor community (Strode et al, 2009).

[9] Encouragingly the three agencies which effectively lead the largest international household survey programmes, USAID, UNICEF and the World Bank (whose programmes are respectively Demographic Health Survey or DHS; Multiple Indicator Cluster Survey or MICS; and Living Standards Measurement Survey or LSMS have recently announced a new collaborative initiative, one of the objectives of which is explicitly to better serve countries in meeting their domestic and international data demands. See http://www.dhsprogram.com/Who-We-Are/News-Room/Establishment-of-a-Collaborative-Group-among-the-DHS-MICS-and-LSMS.cfm

Fourth, while a range of assistance has been offered and delivered by donors, for example funding, equipment, training and peer learning – often priority is given to modelling and projecting to fill data gaps for international comparison (Krätke and Byiers, 2014). Donor support for social statistics sometimes at the cost of economic, financial and agricultural statistics has skewed NSO priorities and made economic management in recipient countries difficult (Strode et al, 2009).

However, in many countries – and in particular low income ones – the role of donors is nonetheless a positive one:

- They are a major source of funding.[10] In 2014 donors' commitments to statistical development were $394 million.[11] This was a 42% increase from the previous year, but considerably lower than the peak of US$557 million in 2011 (PARIS21, 2013b). Countries on the whole have matched this level of investment from their own budgets (PARIS21, personal interview, 2015).
- Their engagement means that there is significantly more socio and socio-economic data available.
- Their capacity building can often result in improvements in the quality of data collection and dissemination.
- Donors bring to a country's focus the need for a solid evidence base to inform policy-making, such as establishing adequate baselines upon which to base progress. In the case of Pakistan for example, donors in consultation with key domestic stakeholders helped construct the first official poverty line in 2001. These set the stage to monitor and evaluate the impact of PRSPs, track progress towards MDG 1, as well to take stock of poverty levels and changes over time.[12]

In addition, donors are improving the rate at which they align with national government priorities. The PRESS 2013 Report finds that almost 90% of support to statistics is aligned with national strategies for the development of statistics (commonly known as NSDSs), that set out a country's own agenda for developing their statistical system. This is up from 32% in 2011 and from 88% in 2012 (PARIS21, 2013b).

However, NSDSs can be overly ambitious, for instance in Rwanda (Donor agency, Chief Statistician interview, 2015); prioritisation might not happen, for instance in Burkina Faso (Strode et al, 2009); and implementation can be difficult if the strategy is based on faulty assumptions, for instance in Nigeria (Kale interview, 2015).

Nigeria's first NSDS, which ended in 2014, assumed that the government was ready to fund its part of the strategy once donors had fulfilled their part. However this did not happen, and as a result, the NSO in Nigeria faced significant budgetary constraints throughout the implementation period. As the country prepares its next NSDS with donor support, the Chief Statistician, Yemi Kale, acknowledges the many advantages that a well-designed NSDS can bring: they help to secure greater funding

[10] Several sources of funding exist, including the Trust Fund for Statistical Capacity Building (TFSCB), the Statistics for Results Facility (SRF), and the multi-country Statistical Capacity Building Program (STATCAP), in addition to bilateral donors (DfID, DANIDA, SIDA, etc.) who have and continue to support individual statistics projects.

[11] In PARIS21's annual PRESS publication the statistical component of a project may sometimes be overstated. For example, a large education project that includes, among many other things, a census of schools, may be included in its entirety although only a small amount is allocated for statistical work. In some cases multiple donors participating in a project may report the same project more than once. Nevertheless, the data reported in PRESS provide the best information available about donors' support for statistics (SDSN, 2015).

[12] The poverty data in Pakistan are contested for various other reasons. For a detailed discussion of this, see Khan et al (2015).

from domestic and international sources as well as provide a roadmap towards building a national statistical system. 'The NSDS is a good blueprint,' he says. (Kale, interview, 2015).

Box 2: The importance of capacity building: Liberia's example

Four years after the end of its 14 year civil war, Liberia re-established its national statistics office, joining it with its geo-information office to form the Institute of Statistics and Geo-Information Services (LISGIS). Significantly its first task was a population census in 2008 as the majority of its national statistics had been destroyed during the war. The majority of the surveys conducted since then have been funded by donors alongside contributions from the government, including the Core Welfare Indicator Questionnaire (2007, 2010), the Liberia Demographic and Health Survey (2013) and the Household Income and Expenditure Survey (HIES, 2014).

The country's experience with donors has, in the recent past, been increasingly positive. The HIES had as objectives to both fill data gaps, but also specifically to build the capacity of national staff. In previous surveys, data had been collected, processed and cleaned at a very basic level by LISGIS or other government ministries, and then often sent abroad for further cleaning and analysis, meaning that it was done so by people who were not intimately aware of the country context. In the case of the HIES, however, the World Bank provided a two-week training for 15 people from LISGIS, whereby they validated the data and key assumptions made by international consultants, as well as learned to write code to clean data using econometric software.

In large part this was because the low-income country had learned from past experiences the importance of asking donors for assistance with capacity building (personal interview, 2015).

In alignment with the above-mentioned Paris Principles, it is vital that any donor assistance is given in a manner that coincides with what the county needs. A cross-country PARIS21 (2013a) survey identified some key areas for donors to prioritise:

The need for management and coordination of the entire statistical system, especially to improve data quality. The means to strengthen management and coordination rest on skills development and technical assistance.

The need for highly skilled staff. The gaps in human resource capacity lie in design (statistical methodologies, process and workflow), in analysis and in strategic planning. The means to do so are mainly financial.

The need for greater dissemination and use of data. This need can be filled through better data dissemination policies and documentation, and also through new technologies. The means to address this can come from technical assistance, resource investment and technological innovation; many more users can then access data in a timely, user-friendly open format.

The need to align aid in statistics with national priorities. In some recipient countries, aid needs to be delivered in line with a wider statistical system-based approach that countries are slowly moving towards (PARIS 21, 2013a).

Conclusion

As the data revolution gathers pace, governments, national statistical offices and donors need to prioritise actions to improve statistical capacity. This report has assessed how past development of national statistical offices as well as donor initiatives can give insights into how that prioritisation could happen.

The main lessons drawn from the literature and, in particular, the three country case studies for governments are:

- South Africa's experience illustrates the critical importance of the census as the bedrock of a national data system and the core of a nation-building effort that is based around the state as a provider of services. This calls for greater prioritisation of censuses and civil registration and the collection of vital statistics.

- Pakistan's experience highlights the need to create a single statistical entity as opposed to several different ones.

- Mexico's experience underscores the need for NSOs to be autonomous as well as for strengthening their capacity to coordinate and innovate.

- Strong legislative frameworks have emerged as a force for change. Statistical Acts enabling chief statisticians to define what constitutes official statistics and what does not matters enormously in countries where fear or favour undermines professional integrity, as was the case in South Africa. Newer legislation needs to reflect emergent relationships between the producers and users of statistics.

- As seen in the case of Mexico, middle income countries frequently have strong country-level consultations that bring users and producers of statistics together. This has been important for building a statistical system that can prioritise, as well as deliver to the needs of end users. In low income countries, however, this process is largely missing. As part of the data revolution, country-level data compacts, are currently being discussed (Glassman, 2014), and may be useful platforms to bring together governments, users such as citizens' groups and academics, donors and the private sector. Together, these stakeholders can work out the priority gaps for each country, and develop a road map to finance and deliver the change needed (Stuart et al, 2015).

Lessons for governments and donors

- Neither countries nor donors should underestimate how long it takes NSOs to build capacity or to provide an appropriate legal framework for data production. In Pakistan, legal and functional restructuring took 51 years; while INEGI in Mexico was established in 1980, it only gained autonomy in 2008 after 6 legislative initiatives over 12 years.

- Reforms will only be successful where they work with the grain of the political system and recognise the incentives faced by political actors within government. This requires a focus on producing statistics that are useful to policymakers in practice and on recognising that political coalitions for reform will need to be built. Political transitions may provide powerful opportunities for these reforms to be enacted, as evidenced by both the Mexican and South African cases.

- Statistical systems are about more than national statistical offices and while the capacity of these is important, so is the creation of reliable data in line ministries. Support to other sectors might include elements regarding improved data collection, while support to the national statistical office should acknowledge its role of coordinator, collator and facilitator of statistical collection elsewhere. This was seen in the case of crime statistics in Mexico.

- Donors need to help countries anticipate game-changers. An example of this is the combining of statistics offices with geographical units as is the case in Mexico. Liberia followed this same model as it rebuild its statistical system after the civil war, thereby increasing its capacity to take advantages of synergies between the two.

- Donors should prioritise their investments according to the greatest need and evaluate the impact of their investments by the largest difference made to statistical development in countries with weak statistical capacity. They should also reduce their emphasis on investing in countries with high statistical capacity, where surveys are already technically sound and regular. Some recent interventions, such as the introduction of an in-country donor statistician in Afghanistan, the Democratic Republic of Congo, Ghana and Nigeria can be examined further to see whether this generates better results both for the country's national statistical system as well as for the donors in question.

- Over time, countries need to reduce their reliance on donors and create their own resource base and sources of funding for statistical activity. All three case study countries in this report finance most of their own official data collection. Managing resources effectively is also important. Data collection is expensive and so is maintaining highly-skilled professional staff. Financing needs to be predictable and regular so that NSOs can continue with their efforts to produce and disseminate quality data. It is also of course important that an adequate budget be made available to the NSOs. In some countries such as Botswana, a census has to be conducted every 10 years by law, thus ensuring that the government allocates the budget to do so.

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This material has been funded by UK aid from the UK Government, however the views expressed do not necessarily reflect the UK Government's official policies.

ISSN: 2052-7209

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