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MAPPING AND ASSESSMENT OF THE DATA ECOSYSTEM IN MONGOLIA

INNOVATION AND NEW TECHNOLOGIES FOR SDG MONITORING

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EXECUTIVE SUMMARY

This report presents our assessment of the current Mongolian “Data Ecosystem” for mobilizing “Data revolution” for better implementation and monitoring of Sustainable Development Goal (SDG) indicators, particularly, those identified as immeasurable by the current national statistical capacity of the National Statistical Office (NSO). The assessment was conducted from two opposing perspectives including top down (looked into the big picture of Mongolian Data ecosystem) and bottom up (studied the immeasurable indicators to pinpoint the root cause). In addition, we took two case studies by selecting two sectors including Health and Governance related SDGs.

A previous assessment tells that total of 228 indicators are applicable for Mongolia in which only 71 are measurable by the current capacity of the NSO while the remaining 157 are not. From them, this assessment further reveals that almost half can become measurable after taking more policy level actions rather than data level. To give an example, an indicator 1.5.3 “Number of countries with national and local disaster risk reduction strategies” does not really need any innovative idea to measure it but rather it can be measured and reported by making the indicator to hold accountable by a certain government entity who can report it to the NSO at regular basis.

By sorting out such indicators, the remaining indicators are left immeasurable for many other reasons:

For instance, many indicators are very new for the NSO therefore, there is no clear definition of the indicators or no data or the existing data is not satisfactory to bring the indicator with sufficient detail. There is no method to collect the data or the existing method is not designed for measuring SDGs or simply there is no one accountable for all these. For some indicators, data is available here and there both in public and private sectors, but there is no collaboration, integrated processing and reporting.

These points are, particularly, revealed by our case studies where we used a review template which reveals all the necessary facts around the indicators like: what definition is used for this particular indicator; whether this is internationally used definition or locally developed one; how frequently the required data is collected; who is the key owner of the data; how the data can be disaggregated; which calculation method is used for calculating the indicator; whether the indicator is fully measured or not, and if not, why; where and at which stage of data value chain has the issue; which actions is required to solve the issue and how we can obtain the data to measure the indicator etc.

As a result, from health related SDGs, we found that there are 26 indicators unmeasured by the current statistics, while from Governance related SDGs, there are 23 indicators in which 11 of

them need reviews on their calculation methodologies and 10 of them are completely new for the NSO.

Majority of them cannot be measured because of the above mentioned reasons including no data (since many indicators are new for the NSO) or the existing data is not collected or no definitions and no calculations methods or some calculation requires participation/data from other sectors etc.

Given the above situation, we propose two solutions for the missing indicators:

First, we recommend to look into the existing potential. By improving the existing solution and eco-system, some SDG indicators can be measured with less effort and shorter time frame. For instance, for Health related SDG indicators, 16 indicators can be calculated every quarter or every year by simply widening or improving existing reporting forms provided by Ministry of Health or NSO in their routine data collections from the primary hospitals (*soum*, *aimag* and district level). Many Governance related SDGs, the respective indicators can be also measured by extending the NSO's periodic household surveys. Adding some new reports to collect data available in *soum* and district level would add good amount of missing data in these sectors with almost no additional cost. It means that use of existing potential in full through adding little effort and “out-of-box” thinking is very vital.

Second, we recommend more revolutionary approach where the indicators can be measured by mobilizing the entire data eco system through implementing better collaborations of the respective data holders and better use of existing data generated elsewhere. The revolutionary approach can see the solution fundamentally therefore, it is more long term-beneficial. Because, such revolutionary approach does not only help unmeasurable SDG indicators to be measured but it also can make the measurable SDG indicators to be measured in more cost effective, more accurate, and faster way. Today the NSO or the respective ministries are very likely doing expensive traditional surveys or census to collect data very frequently (quarterly or annually) while the data is already available in somewhere (in some government agency or in some private organization) or there is more efficient way doing such traditional works by utilizing modern IT technologies and infrastructures. If they start using that existing data, or registries, or technologies they may save a lot of cost. Particularly, the government has fast growing data from its rapidly digitizing e-government services where it has more than 40 agencies who have a certain Information Management System (IMS) in place. Some exist already more than 10 years while majority are running for 2 to 5 years. The private sector is equally growing fast. The leading players are financial and telecommunication companies. Both sector has reached saturation in terms of user base and well-established infrastructures. It is hard to find anyone with no bank

account or mobile number (i.e., number of active mobile phone is more than Mongolian population).

Implementing such revolutionary approach is a big challenge and we conclude that it needs at least the following 6 key pillars to be addressed: the first pillar is national level consensus on the key concepts and principles. It is important that decision-makers understand the phenomena of big data, open data and data revolution taking place both globally and in Mongolia, and how these phenomena can be harnessed for monitoring sustainable development. In addition, it is crucial to have national consensus on main definitions, terms, translations and methodologies to measure each and every indicator.

The second pillar is a legal framework which carefully considers sensitive aspects such as data privacy and human rights on the one hand, and removes blocks, provides incentives and supports mechanisms to stimulate data sharing on the other hand. We conclude that the current legal framework needs significant update on this new situation to push data revolution by encouraging more open collaborations between government agencies and between private and public sectors while ensuring the privacy and security issues of the people and organization.

The third pillar is a national standard that is compliance with the respective international standards to provide a common language to make data to be understood between different stakeholders or systems to enable collaborations, interoperability, data exchange and consistency between data of relevant stakeholders, including in the public and private sectors.

The fourth pillar is ICT infrastructure and introducing big data technologies. Particularly, it is now time to start creating sector wide or nationwide umbrella data warehouses based on big data technologies for analytical purposes. To give an example, in the Health sector only, there are more 18 different databases running independently as siloes. A centralized Health data warehouses can enable better data exchange and much more insightful analysis. In fact, it is well known that a single source of data is not sufficient to get full detail or correlations of any analyzing items. At least pair of sources provides much more insights. This requires a great extent of collaboration, leadership among the data holders. Therefore, we give the following basic recommendations. First, **a sector wide standardization and consolidation appears to be the key step**. For instance, the Health sector needs such a data exchange center or centralized data warehouse. The same example can be said for Mongolian justice sector where all key stakeholders have now some sort of systems (e.g., Police IMS, Prosecutor IMS, Court IMS, and Court Decision Enforcement IMS) but they are not connected and the data are not consistent, duplicated and hard to get integrated reporting and analysis. Second, once the sector wide standardization and consolidation take places, **it is the next step to have a nationwide**

standardization and consolidation that will enable data exchange and data flow inter-sectors (between healthcare and justice) and between private and public sectors.

The fifth pillar is human resources with required skills and capacity. We need people who can understand the technology trends and who can implement it on the ground. Particularly, it is crucial to make decision makers to understand the importance of data and power in them, thereby, nurturing data-driven decision making culture at the all levels.

The sixth pillar is leadership and institutional engagement, which is the key success factor for the all other pillars. Particularly, the leadership from the NSO is utmost important in doing national level data revolution to become data driven country for sustainable long term development.

In addition to the above, we provided a detail recommendations for each area and also some quick wins that can easily be implemented for better monitoring SDG indicators in shorter time frame. We also provided more detailed recommendations for two selected sectors (Healthcare and Governance) covering each indicator.

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ABBREVIATIONS

SDG	Sustainable Development Goal
MDG	Millennium Development Goal
UN	United Nation
UNDP	United Nation’s Development Program
IoT	Internet of Thing
CSO	Central Statistical Office
NSO	National Statistical Office
DB	Database
EFTA	the European Free Trade Association
ESCAP	the United Nations Economic and Social Commission for Asia and the Pacific and
ECE	the United Nations Economic Commission for Europe
GA	Global Assessment
NSS	National Statistical System
IMS	Information Management System
ZSL	Zoological Society of London
IUCN	International Union for Conservation of Nature

KEY TERMS

Big data	is a term for data sets that are so large or complex or exponentially increasing that traditional data processing applications are inadequate to deal with them (Wikipedia). Because, such exponentially increasing amount of data usually includes data sets with sizes beyond the ability of commonly used traditional infrastructure, data managing software tools, technologies and methodologies to collect, integrate, validate, manage, and process data within a tolerable elapsed time. They are different from traditional data in 3 key characters including their Volume, Velocity and Variety. The volume refers to the increased amount of data to be managed, the velocity refers to the increased pace of data generation as well as its use and interaction, and the variety refers to the many and often incompatible data formats, structures, and semantics.
Open data	is the idea that some data should be freely available to everyone to use and republish as they wish, without restrictions from copyright, patents or other mechanisms of control. (Wikipedia)
Data revolution	“Better data and statistics will help governments track progress and make sure their decisions are evidence-based; they can also strengthen accountability. This is not just about governments. International agencies, CSOs and the private sector should be involved. A true data revolution would draw on existing and new sources of data to fully integrate statistics into decision making, promote open access to, and use of, data and ensure increased support for statistical systems.” (HLP Report, P23)
Data source	A data source is any of the following types of sources for (mostly) digitized data: a database, a computer file, a data stream (Wikipedia)

1 PREFACE

This section explains the objective of this work, the scope agreed and the methodology applied.

1.1 OBJECTIVE AND SCOPE

The overall objective of this work is to assess the current Mongolian data ecosystem for implementing and monitoring Sustainable Development Goal (SDG) indicators through innovations, new data sources and technologies (such as globally known Big and Open Data technologies), particularly those cannot be measured by the current capacity of the National Statistical Office (NSO) of Mongolia.

The assessment covers: (1) a literature review of SDGs and the respective data gaps, and (2) a review of the official statistical capacity in Mongolia;(3) a review of the key data communities, stakeholders both in public and private sectors in the country and technical and legal challenges in engaging and mobilizing them to implement SDG monitoring; (4) in-depth review of two sector case studies – Health and Governance to find new ways for improved data collection, dissemination and use, and effective institutional collaboration.

1.2 METHODOLOGY

To achieve the above project objective, this assessment was conducted from two opposing perspectives: top-down and bottom-up. In the top-down perspective, we tried to draw a big picture of Mongolian data eco-system by identifying key data players and communities so that to explore solutions how to engage and mobilize them, particularly, new, non-traditional players for leveraging non-traditional data sources and techniques for monitoring SDG indicators. In the bottom up perspective, we started from certain selected SDG indicator groups to understand why some indicators cannot be measured by the current official statistical capacity. In such a way, we tried to find areas for innovation and improvement in different stages of data value chain such as data collection, dissemination, and use etc.

2 INTRODUCTION

This section introduces the Sustainable Development Agenda, SDGs and their indicators and the relevant efforts made by the government of Mongolia and the current status etc.

2.1 SUSTAINABLE DEVELOPMENT AGENDA AND SGDS

At the United Nations Sustainable Development Summit held in New York on September 25-27, 2015, the Heads of State and Government adopted the 2030 Agenda for Sustainable Development, and the ambitious and far-reaching Sustainable Development Goals (SDGs). While Agenda 2030 expresses the spirit of the aspiration of countries for sustainable development, the SDGs translate this spirit into concrete, quantifiable goals and targets. The Sustainable Development Goals, which were further refined by the UN Inter-Agency and Expert Group, entered into force on January 1, 2016. The SDGs build on the success of the Millennium Development Goals (MDGs) in mobilizing collective action around a time-bound set of globally agreed goals. The eight MDGs were adopted in 2002 as a framework to operationalize the Millennium Declaration. The Declaration, adopted by Member States of the UN General Assembly in the year 2000, articulated the world's "collective responsibility to uphold the principles of human dignity, equality and equity at the global level" and to eradicate the world's most extreme and deplorable conditions, including poverty and destitution. The MDGs, which conclude at the end of 2015, focus on the most vulnerable populations, and address extreme poverty, hunger, disease, gender equality, education, and environmental sustainability. The SDGs include most of the MDGs but go much further in comprehensiveness. In contrast with eight MDGs, there are 17 SDGs. The SDGs set out quantitative objectives across the social, economic, and environmental dimensions of sustainable development to be achieved by 2030. The goals provide a framework for shared action "for people, planet and prosperity," to be implemented by "all countries and all stakeholders, acting in collaborative partnership." The 17 goals contain 169 targets which set out quantitative and qualitative objectives for the next 15 years.

Figure 1 – 17 Sustainable Development Goals (SDGs)

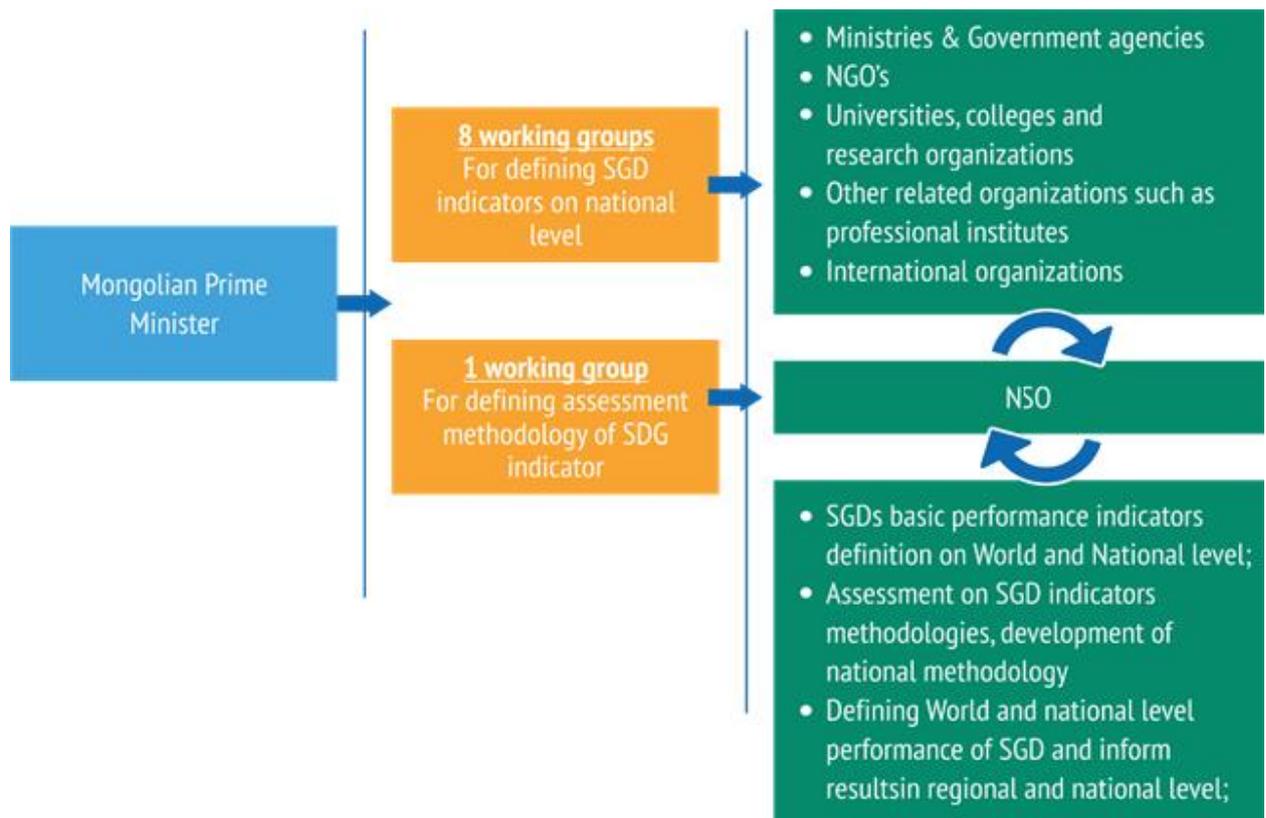


These targets are “global in nature and universally applicable, taking into account different national realities, capacities and levels of development and respecting national policies and priorities. Member States and Governments are encouraged to take action on the plans and to integrate the SDGs and targets in their national strategies to implement them in their countries. At its forty-sixth session, the United Nations Statistical Commission created an Inter-agency and Expert Group on SDG Indicators (IAEG-SDGs), composed of Member States and including regional and international agencies as observers. The IAEG-SDGs group published a first list of 304 indicators in March 2015. Since then, the 2nd IAEG-SDGs meeting held in Bangkok during November 4-7, 2015 led to a new and streamlined list of 224 global indicators. Out of 224 indicators, 161 had been coded “green” by the IAEG-SDGs Group which means that a consensus had been reached between its members while the remaining 63 “grey” coded indicators are still to be validated by the group. Agenda 2030 and SDGs do not only rely on official data. They are meant to be supported by a wider data ecosystem in which all kinds of data stakeholders take part. Governments can also set their own national targets and indicators to take into account national specifics.

2.2 SDGS IN MONGOLIA AND THE CURRENT MEASURABILITY RATE BY THE NSO

In 2015, the Parliament of Mongolian has approved Mongolia’s 2030 Sustainable Development Vision, which charts the country’s development path for the next 15 years – the period of the Sustainable Development Goals. This Mongolia’s 2030 Vision firmly anchored in the Sustainable Development Goals and the 2030 Agenda for Sustainable Development approved by World leaders. This makes Mongolia one of the global early adopters of the SDGs. Figure 2 illustrates some key follow-up actions which are led by the Prime Minister of Mongolia. As presented, nine working groups already started working to sort out and understand SDGs in local situation and within the working groups, the NSO plays key roles by coordinating them.

Figure 2 - Works ongoing for SDG implementation in Mongolia

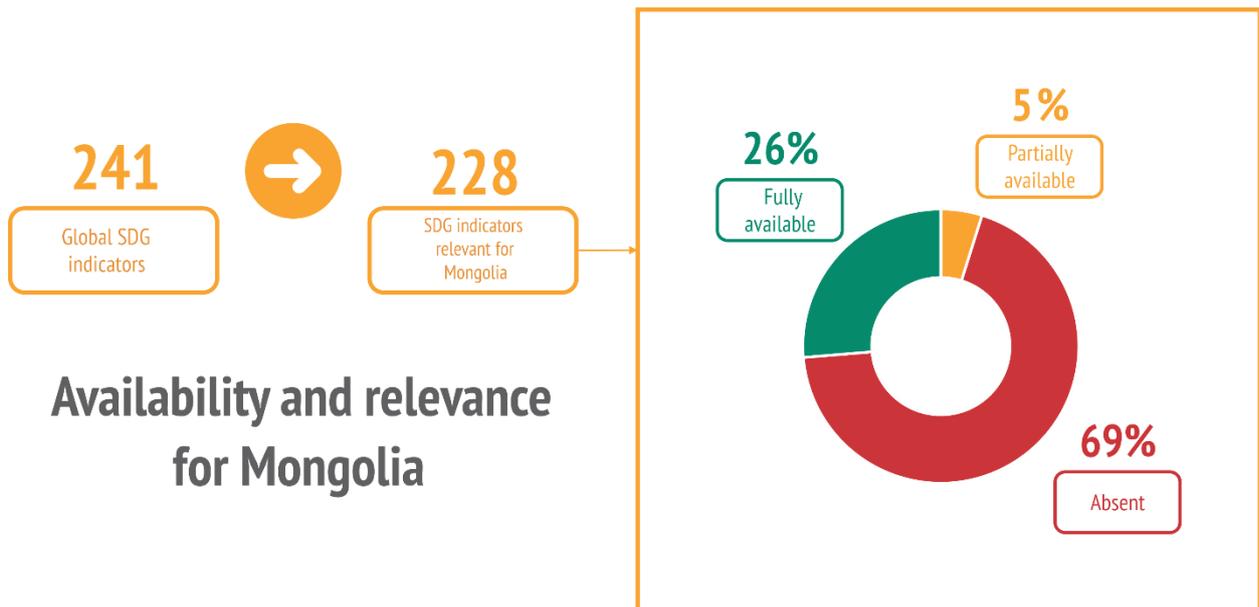


As one of the key outcomes of the above activities, an assessment was already undertaken for SDGs in Mongolia funded by UNEP and UNDP in December 2015, (i.e., SDG gap assessment) in which it:

- Reviewed SDG indicators to determine which indicators are applicable to Mongolia.
- Identified SDG indicators those can be and cannot be measured by the current capacity of the NSO.

As shown in Figure 3, the assessment concludes that 228 SDGs out of 241 are applicable to Mongolia.

Figure 3 – SDG indicators' gap assessment results



From these 228 indicators, 71 indicators (31%) can be measured at the national level from the NSO while the remaining 157 (69%) SDGs are not available. The majority of 17 SDGs have over more than 50% unavailability in the indicators. More specifically, Goal 3 (social), Goal 8 (economic), Goal 16 (governance) and Goal 18 (partnership) have over 15 indicators unavailable. Goals 12, 15, 16 and 17 have the largest number of indicators not available. This suggests that most of the efforts should be directed towards the areas of Governance, Economy and Environment related SDGs.

3 REVIEW FOR CURRENTLY IMMEASURED SDG INDICATORS

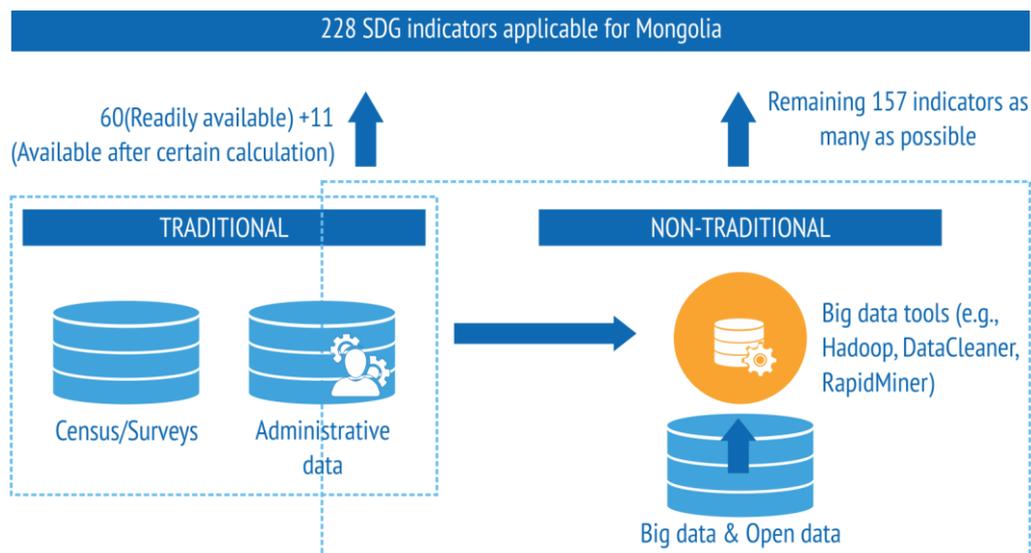
Only a quarter of SDG indicators is currently available through the current capacity of the NSO. The current capacity of the NSO is focused to produce the periodic official statistics of Mongolia and is based pretty much on data that are created by nationwide census/surveys and administrative data collected from the respective ministries and government entities. We call them traditional approach.

For the remaining indicators, it is clear that they can be measured by two ways as shown in Figure 4:

1. By extending or improving the traditional approach such as putting more relevant questions in the questionnaire form of the census and surveys or by creating completely new additional census and surveys or by making policy level decision to hold certain government administration accountable for the indicators etc.
2. By developing and using non-traditional approaches.

In this report, non-traditional approach is used in a broad sense. It includes 1) data generation from completely new, non-traditional sources (such as big data source like social media, mobile telephones or smart devices), 2) data generation from traditional sources, but processed and presented using non-traditional technologies such as Big data tools and 3) data generation combining both traditional and non-traditional sources as shown in Figure 4.

Figure 4. Traditional and non-traditional approaches to SDG indicator



In this work, we made a review on the SDG indicators to see which indicators actually can be measured by extending or improving the traditional approach and which need further study to look into non-traditional approach. The review was done using the following six criteria:

- (i) For measuring of a given indicator, it is not necessary to look into non-traditional approach. Rather the indicator can be estimated by traditional approach through policy decisions
- (ii) Measure indicators using traditional data sources and new technology and methods
- (iii) Measure indicators using non-traditional data sources which don't belong to government generated Big Data
- (iv) Measure indicators using both traditional and non-traditional sources
- (v) Measurement of indicators is difficult and unclear
- (vi) Measure indicators through using government big data or connecting existing data bases

Figure 5 - SDG indicators assessment in Non-traditional source



The outcome of the review is presented in Figure 5. As shown, a significant portion of the immeasurable indicators can be measured by extending the traditional approach or policy level decision making. To give an example, an indicator 1.5.3 “Number of countries with national and local disaster risk reduction strategies” does not really need any non-traditional innovative idea to measure it but rather it can be measured and reported by making the indicator to hold accountable by a certain government entity who can report it to the NSO at regular basis. Excluding such indicators, only 51%, namely, ~80 indicators need further study in non-traditional approach to measure them. It is pretty clear that there are opportunities, particularly, with respect to the recent advances in technologies and trends such as possibility of using exponentially grown data (i.e., big data) both in public and private sectors and respective data processing technologies. However, it is also pretty clear that the idea of using exponentially growing data for measuring the sustainable development indicators is actually a long hard effort that needs a tremendous efforts from both public and private sectors to collaborate. This is actually recognized at the global level by UN who is taking the leadership in this direction by calling “Data revolution” worldwide.

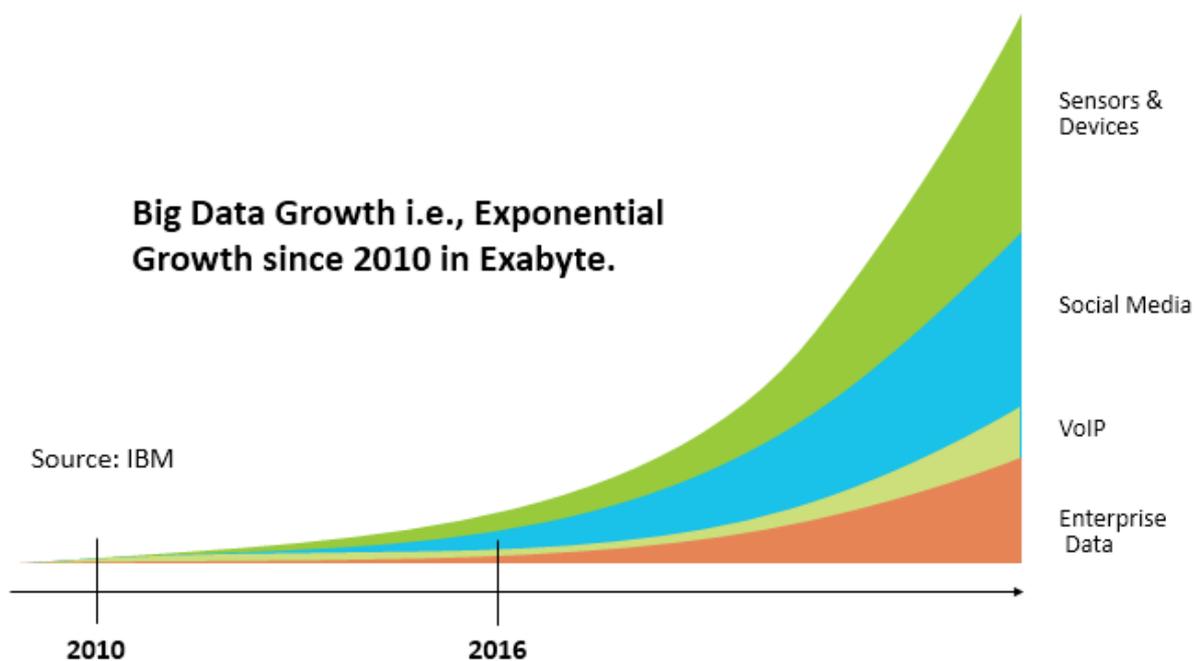
4 BIG DATA AND OPEN DATA CONCEPTS, NEED FOR DATA REVOLUTION FOR IMPROVING SDG MEASURABILITY

The last few decades of information technology advances (e.g., so called nexus of forces: Big data, Mobility, Social platforms, and Cloud) introduces completely new landscape for ordinary people, businesses, and governments around the world and even for entire industries and societies. Many governments and business and international organizations around the world are looking back at the way they do business to adapt it or to change dramatically so that to survive in the new stage. This section introduces big data and open data concepts, subsequently explains the need for data revolution for improving SDG measurability.

4.1 BIG DATA

Big data is not hype but reality. “The entire data of the world today will account for less than 10% of the entire data in the world of two years from now” (Source: Dell, IBM). We are living in such an interesting moment of the history where the big data explosion just started happening as shown in Figure 6.

Figure 6- Big Data explosion and key contributors (Source: IBM)



Source: IBM, <https://www.ibm.com/big-data/us/en/>

The graph below shows the estimated amount of total data existing in the world over time and projected into the future, in Exabyte¹. Until 2010, this amount was not significant. But since then, the technology advances (e.g., internet, smart phone, social networking, Internet of Things) that have occurred in the past decade stimulated the growth of the data at exponential speed. There are four key sources behind this data explosion:

- 1) Enterprises including both public and private sectors that are increasingly digitizing their operations and businesses. Some leading examples of such digitization include E-Government initiatives (4E-GOVERNMENT FOR THE FUTURE WE WANT, 2014), e-Banking and Fintech initiatives, technology-based business disruption models including Airbnb, Uber, and Alibaba.
- 2) VOIP and Messaging apps such as by Skype, Viber, Wechat, WhatsApp etc. In 2016, the worldwide consumer VoIP traffic is expected to reach 158 petabytes ²per month. Telecoms are losing an average of 700,000 landline customers per month. While this decline is partly attributed to increased cellular access, VoIP is certainly a contributing factor. Since VOIP and Messaging Apps are giving big benefits to consumers in terms of

Every day, we create 2.5 quintillion bytes of data. This data comes from everywhere: sensors used to gather climate information, posts to social media sites, digital pictures and videos, purchase transaction records, and cell phone GPS signals to name a few. This data is big data. Source: IBM

cost and efficiency, the exponential growth in data from these sources is set to continue.

- 3) Social networking and big social platforms including Facebook (1.65b monthly active users which accounts 1/4th of the world population, 600TB of data generated on daily basis), Twitter (310m users and 500m tweets per day, considered as the fastest method to disseminate information), Instagram (400m active users that generate 1.7m likes per minute) etc.

- 4) Sensors and devices that is stimulated by Internet of Things (IoT). The IoT links smart objects to the Internet. It can enable exchange of data never available before, and bring

¹ The Exabyte is a multiple of the unit byte for digital information. The prefix “exa” indicates multiplication by the sixth power of 1000 (10^{18}) in the International System of Units (SI)

² The petabyte is a multiple of the unit byte for digital information. The prefix “peta” indicates the fifth power of 1000 and means 10^{15} in the International System of Units

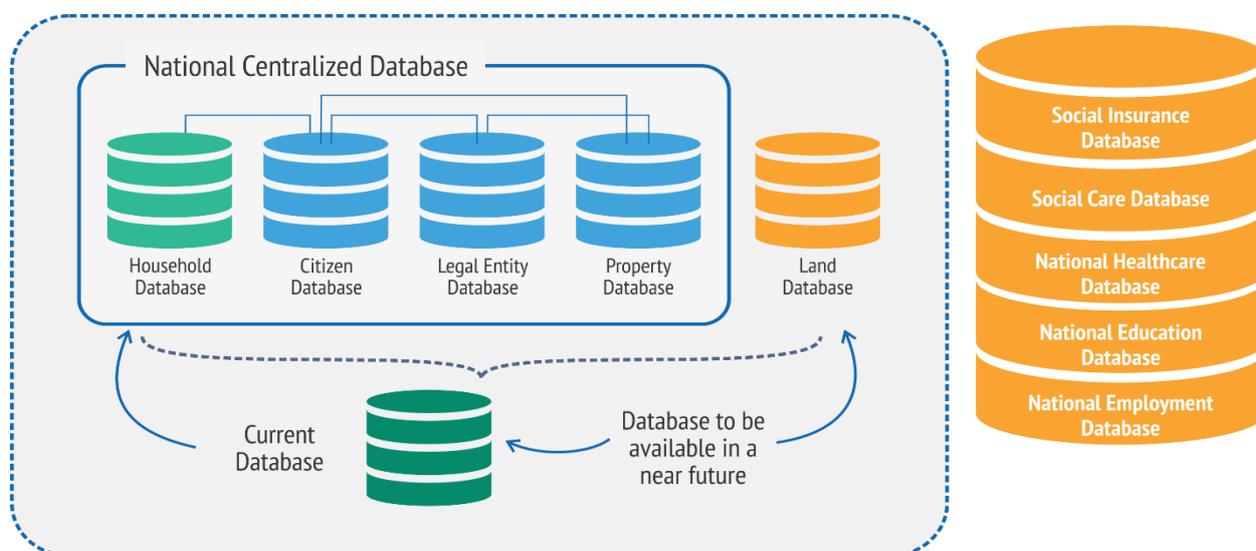
users' information in a more secure way. Cisco estimates the IoT will consist of 50 billion devices connected to the Internet by 2020. In 2013 the Global Standards Initiative on Internet of Things (IoT-GSI) defined the IoT as "the infrastructure of the information society." That is why we see sensors and devices as potentially the biggest contributor in this big data exponential growth.

Powered by the above four sources, this historical change is bringing tremendous opportunities and changes in all industries and sectors. Some studies predict that Big Data itself will become an industry. In the US, for instance, it will contribute 1.7% GDP growth by 2030 as estimated by the Economist Intelligence Unit; McKinsey Global Institute. Many big enterprises are adopting the Big Data as the key competitive edge to keep their leadership in 21st century as we see in the example of Rolls Royce (see the box below). Not only enterprises, but also governments and international

Rolls Royce's success in applying Big Data analytics has influenced the aircraft engine-manufacturing sector. The company consistently monitors approximately 3,700 engines, each of which has hundreds of sensors installed, to predict when and where breakdowns may occur. Roll-Royce has transformed from selling only engines to selling packages of both engines and monitoring services and the service currently accounts for more than 70% of their annual revenue in their aircraft engine division.

organizations are heading toward to the trend. Government data is a big part of the enterprise data.

Figure 7- National Centralized Database model (Source: NSO of Mongolia)



The government big data is coming from many e-government initiatives around the world and it is enabling the governments to get new insights and to engage the public and, ultimately, to get evidence for better and timely decision making. Mongolia is not an exception in this big data explosion. Particularly the potential lies in the government data due to tremendous efforts in implementing e-Governance over the past 10 years.

Today, more than 40 government institutes and agencies have some level of information management systems in place with various forms. As a results, Mongolian government has a pretty good base for achieving wide-ranging e-Governance. Given this good base, NSO is taking a leadership to create an integrated database as shown in Figure 7 and working toward introducing a national standard for having one common language for the integration. Such leadership is a very good systematic approach for creating government big data platform.

4.2 OPEN DATA

While big data sources are bringing many potentials for the government, open data initiatives will accelerate collaborations and has a potential to become a common platform for data sharing inside and outside of the government. There is an increasing tendency to open data. Particularly, discussions on open data are actively happening within governments around the world. For example, with the leadership from the US government, an Open Government Initiative was established in 2009 to create an unprecedented level of openness in Government. The Mongolian government has been taking an active part in such international initiatives, particularly, for the open data and open government initiatives. Table 1 provides a summary of open data initiatives in Mongolia.

Table 1 - Open data initiatives in Mongolia

Initiative	Year started	Key actions taken so far
OGP (Open Government Partnership)	2013 - ~	The OGP initiative was launched in 2011 and Mongolia has started its action to join the initiative since 2012 and became member in 2013. The key priorities of Mongolia’s OGP Action Plan are a) Improving public service b) Increasing transparency of public institutions c) Enhancing justice and reducing corruption. Under these priorities, Mongolia commits to strengthen its transparent budget system, improve the quality of public service and pursue fair, accountable policies.

		Source: http://www.opengovpartnership.org/country/mongolia
Open Data	2014 - ~	Open data initiative and its concepts started being actively heard in Mongolia since 2014 and there were several high level workshops held within public/private institutions under leadership of Prime minister and Cabinet Secretariat of Government of Mongolia as well as World Bank. Under such initiatives, some projects were carried out such as Open/Big Data project of Ulaanbaatar City council which entailed installing of smart card readers in the city public buses and analyzing the data of traffic to inform decisions to adapt public bus routes.
Open Procurement/ Budget	2012 - 2016	Two key projects were undertaken successfully to implement these initiatives in technical and legal perspectives.

Commitments under the Open Government Partnership reflect Mongolia’s experience and aspiration to develop open and transparent government. The adoption of the Anti-Corruption Law and the Law on Information Transparency and the Right to Information in 2011, as well as accession to the UN Convention against Corruption in 2005 were important milestones on the way to joining the Open Government Partnership Initiative.

Though Open Data global initiative has much bigger objectives and purposes as mentioned above, this initiative is a crucial movement in accelerating data revolution, particularly, for creating data sharing platform. In many cases, it is known that one source of data cannot bring much value, rather one can derive the greatest benefit and real value when the sources are combined. Therefore, such sharing platform is good place for combining sources. Here are some examples:

Zoological Society of London (ZSL) manages large datasets (Keeso, December, 2014). One of these datasets is the Living Planet Index, which includes population time series for roughly 3000 species and 11,000 populations and contains approximately 30 to 40 years of data for each. Moreover, this data encompasses metadata about that species, such as threat status and whether or not it’s a migrant species (ibid). ZSL analyses this data and publishes the Living Planet Report in partnership with WWF-UK as a science-based report on the health of the planet and impact of human activity (wwf.panda.org). The greatest benefit derived from this data however, is yielded when it is paired with other datasets, namely habitat change data and the International

Union for Conservation of Nature (IUCN) Red List. The IUCN reviews the data provided by ZSL to determine which category of risk that a species falls under (ibid).

Another example can be derived from a recent project conducted by Ulaanbaatar Municipal's IT department to create a big/open data platform aiming to provide a data sharing platform for all 65 agencies of the city for making a single place for accessing all the city related data. The project took place within a year and created a big data platform based on Hadoop technology as well as an open data platform based on CKAN technology. The project ended by covering only 10 entities out of 65 for those who have clear data and the required minimum level of infrastructure. Still, these 10 entities provide much opportunities since the data sources can be combined. The project implementation revealed valuable insights and lessons learned to inform future implementation of a similar initiative at the national level.

4.3 THE NEED FOR DATA REVOLUTION FOR MEASURING SDG INDICATORS

As stated in the previous session, big data is bringing a completely new world for everyone. Some are already living in this new world (See an example of Rolls Royce, Facebook etc).

But too many people, organizations and governments are excluded because of lack of resources, knowledge, capacity or opportunity. There are huge and growing inequalities in access to data and information and in the ability to use it.

Too often, these rapidly grown data remain unused because they are released too late or not at all, not well documented and harmonized, or not available at the level of detail needed for decision-making.

Without immediate action, gaps between developed and developing countries, between information-rich and information-poor people, and between the private and public sectors will widen, and risks of harm and abuses of human rights will grow (Claire Melamed, 2014).

Given this situation, the **need for a 'data revolution'** was first expressed by the High Level Panel, appointed by UN Secretary-General Ban Ki-moon to advise on the global development

New Technologies are leading to an exponential increase in the volume and types of data available, creating unprecedented possibilities for informing and transforming society and protecting the environment. Governments, companies, researchers and citizen groups are in a ferment of experimentation, innovation and adaptation to the new world of data, a world in which data are bigger, faster and more detailed than ever before. This is the data revolution. Source: undatarevolution.org.

agenda after the 2015 MDGs. As a result, the United Nations Secretary-General's Independent Expert Advisory Group on a Data Revolution for Sustainable Development (IEAG) made an initial review and produced a report "World That Counts" (Claire Melamed, 2014).

The group identifies that there is an urgent need to mobilize the data revolution for all people and the whole planet in order to monitor progress, hold governments accountable and foster sustainable development. Better data and statistics will help governments track progress and make sure their decisions are evidence-based; they can also strengthen accountability. This is not just about governments. International agencies, CSOs and the private sector should be involved. A true data revolution would draw on existing and new sources of data to fully integrate statistics into decision making, promote open access to, and use of, data and ensure increased support for statistical systems. " (HLP Report, P23). As stated in IEAG' final report (Claire Melamed, 2014), it defines the following outcomes to be for data revolution for SDGs:

- The integration of these new data with traditional data to produce high-quality information that is more detailed, timely and relevant for many purposes and users, especially to foster and monitor sustainable development;
- The increase in the usefulness of data through a much greater degree of openness and transparency, avoiding invasion of privacy and abuse of human rights from misuse of data on individuals and groups, and minimizing inequality in production, access to and use of data;
- Ultimately, more empowered people, better policies, better decisions and greater participation and accountability, leading to better outcomes for people and the planet.

5 MOBILIZING MONGOLIAN DATA COMMUNITIES FOR SDG

This section introduces the current state of Mongolian Data ecosystem and consequently presents approaches and key steps developed by the research team for mobilizing data revolution in Mongolia for improving SDG measurability.

5.1 MONGOLIAN DATA COMMUNITY

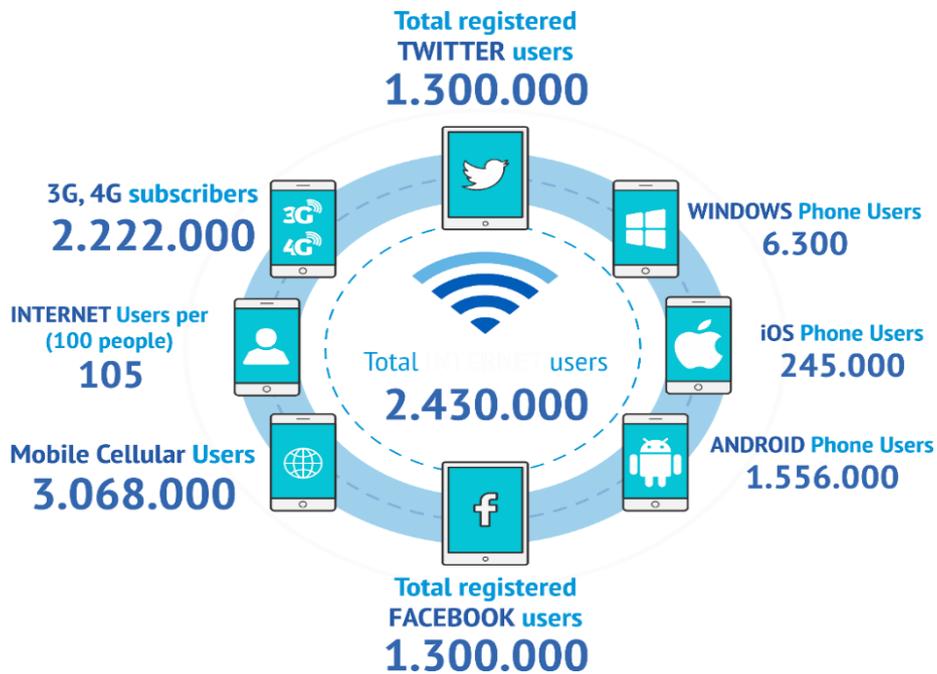
There are three key players in the Mongolian data community: Data generators (ordinary citizens, business organizations, machines, etc), Data transmitters (Network Service providers, ISPs, etc) and Data holders or owners (Business organizations, Governments, etc).

5.1.1 Data generators and transmitters

In Mongolia, it is relatively easy to adopt new information and communication technologies, partly because they allow better and more cost-efficient communication in this country with very

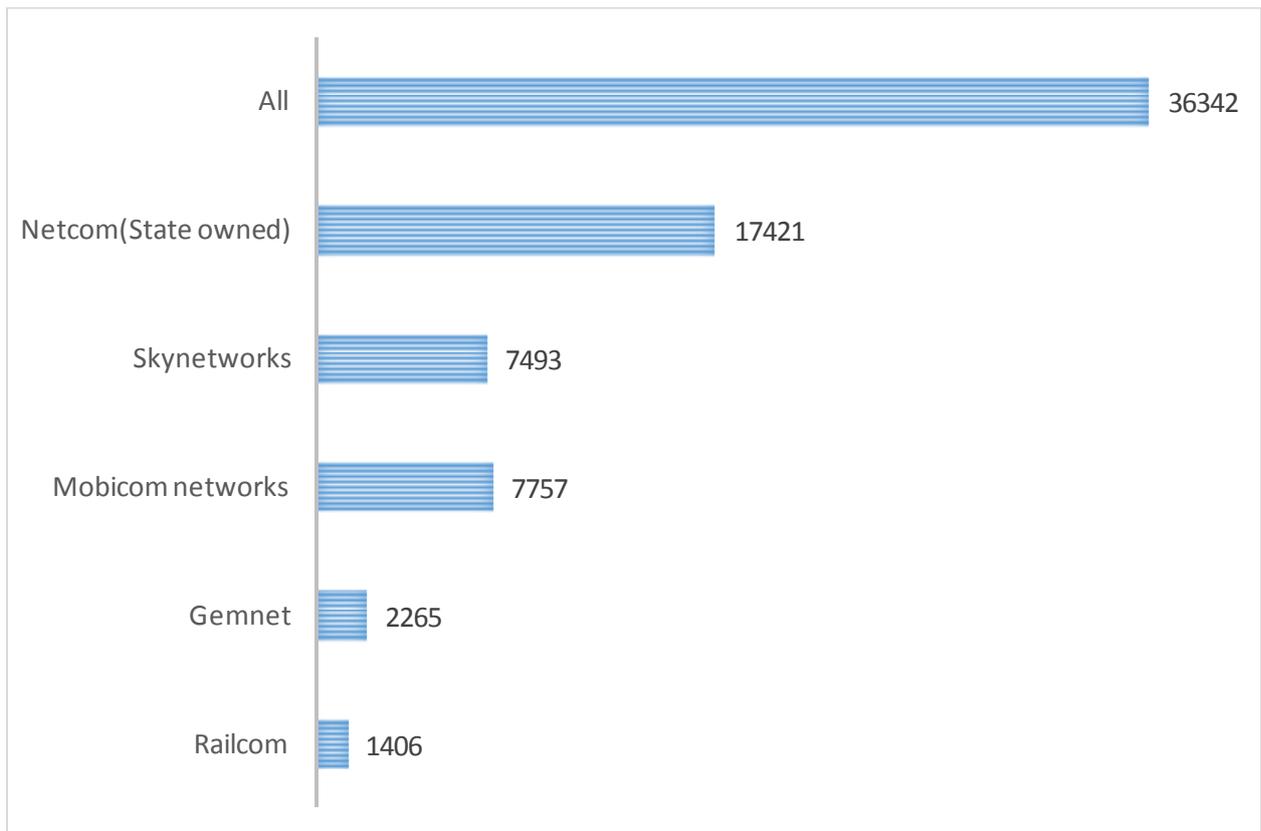
low population density. Within just 10 years, the number of ICT users in Mongolia, with its population of only 3 million, has grown dramatically. This is well illustrated in Figure 8.

Figure 8 – Mongolian ICT statistics



By 2015, we already have more than 3 million active mobile service subscribers which is almost close to the Mongolian population while Facebook user base growing 100% every year reaching 1.3m people. The number of broadband internet subscribers is also growing fast and the cost has been reducing significantly over the decade. The broadband connectivity is particularly good in the capital city, while in the countryside, the government and telecom companies keep making investment to improve the level as presented in Figure 9.

Figure 9 – Mongolian fiber network lines by company (km) Source: CRC Mongolia



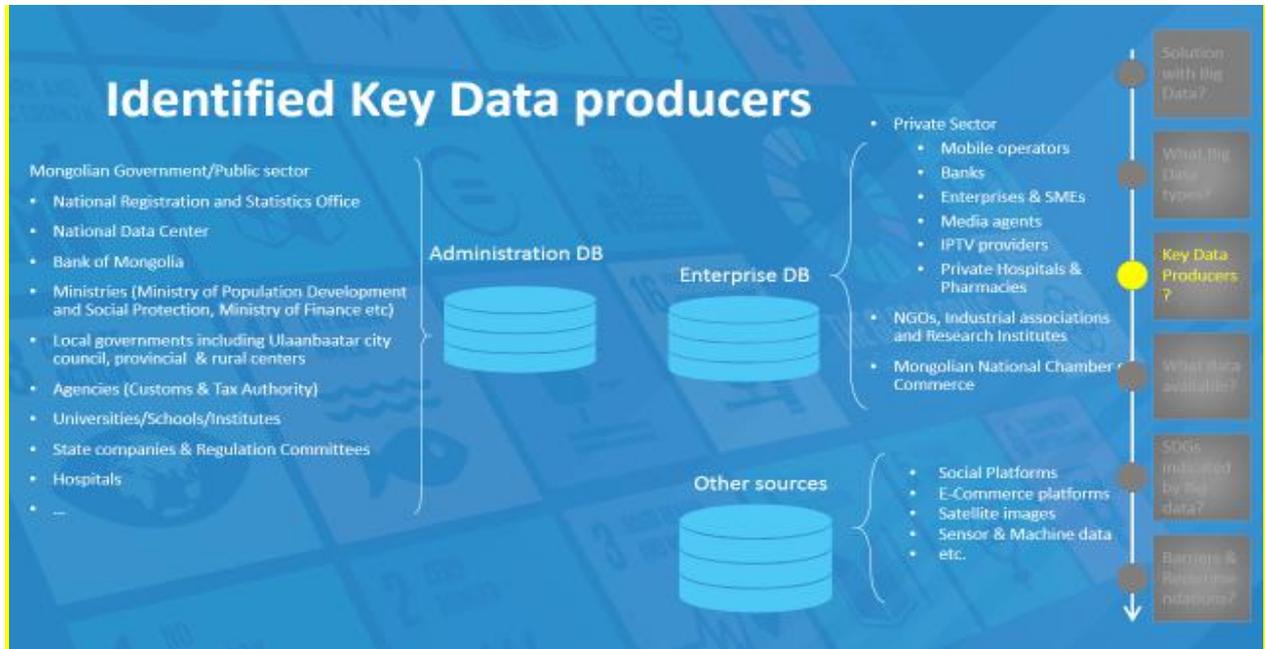
5.1.2 Key data holders

We identified four key data holders shown in Figure 10 in Mongolia:

1. Government – There are already more than 40 government agencies using some sort of information management systems. The majority has been using such system for 3 to 10 years. The key types of data include all kinds of registrations such as citizens, legal entities, properties, lands, patients, students, pupils, homes, children so on and all kinds of records for government services such as prosecution service, hospital services so on.
2. Banks – There are more than 10 commercial banks operating nationwide. The financial sector is actually the leading sector in terms of investments made into the information technology. As such, this sector has the most advanced, well-established systems and solutions with the most data accounting for the last 15 years. The key types of data include all kinds of financial transactions of entities and citizens.
3. Telecom operators – There are 4 leading operators (Mobicom, Unitel, Skytel and G-Mobile) having nationwide network providing voice and data services. They plays actually two roles: one of the key data transmission players through its nationwide infrastructure and they possess significant amount of data as well.

- Social platforms – The most widely accepted and used social platforms include Facebook, LinkedIn, and Biznetworks etc. The latter one is the local system used by people and companies for local labor market.

Figure 10 - Key data owners in Enterprise data source



With respect to the 4 key sources of Big data perspective (Sensor & Devices, Social platform, VOIP, and Enterprise Data), Table 2 - Big data sources and their status in Mongolia shows the current and future status of these sources in Mongolia.

Table 2 - Big data sources and their status in Mongolia

Data types	(Potential) Key data sources	Current Status	Potential Future state
Sensors & Devices	Potential data owners can be the government and private sectors who poses the key infrastructure such as electricity grid or smart home solution providers.	In Mongolia, this type of data is currently minimal. But, it has a huge potential ahead when the government and the private sectors started implementing smart solutions (e.g., smart grid, smart home, or smart city) across the country.	It is a great potential to become one of the leading data sources in 5 to 10 years. It needs a strong leadership from both public and private sectors particularly in IoT related projects such as Smart City, Smart Grid or Smart Home related projects.
Social Platform	Though the key owners include global social platform providers such as Facebook, Twitter etc, there is a big role for dominant and active users in the platform such as Facebook page or group owners.	In Mongolia, this type of data is growing fast just like the global trend. The social platforms started making a huge change in communication between people, particularly for linking and enabling the voice of the socially sensitive groups such as Gay community, Women, Domestic violence etc.	The global social platforms are expected to still dominate the local market. Therefore, it is more crucial to find ways to get cooperation with such platforms at national level both from private and public sector perspectives.
VOIP	There is no direct data owner for this type.	This is rapidly growing data in Mongolia. However, we	In the future, VOIP based solutions can be an effective

		conclude this type of data's nature is temporary data i.e., not resides in any databases and not owned by any entity, therefore not directly applicable for SDG monitoring.	mechanism for conducting survey like crowdsourcing.
Enterprise Data	In Mongolia, there are 3 key players that has the most enterprise data: The first is the government of Mongolia, the second are Banks, and the third are Telecom operators.	This type of data is growing the fastest in Mongolia and the most potential source for SDGs. The government of Mongolia is the main stakeholder.	This is the key area for SDG monitoring and where the innovation or concrete outcomes can be achieved. To accelerate the process, it requires a national standard to have a common language to link all separate data to relate each other.

From the table, we can summarize the following key conclusions:

1. Enterprise Data (particularly the Government Big Data) is the biggest potential data source and plays the key role in Mongolian data eco-system.
2. Foreign social platforms play dominant role in Mongolia, therefore, it has a limited potential in terms of direct data sourcing. However, it still possesses a great opportunity in terms of finding data source indirectly.
3. At the moment of writing this report, Sensors/Machine data is not visibly significant. However, in the long term, this type of data is expected to grow faster when more and more "Smart" titled projects (e.g., Smart home, Smart City, Smart Grid so on) will come.
4. We conclude that VOIP data is not really relevant in becoming a potential data source for SDG monitoring but VOIP technology can be looked as a way of innovation to expedite process in the data value chain (data collection, distribution etc).

5.2 MOBILIZING THE DATA COMMUNITY FOR IMPROVING SDG MEASURABILITY

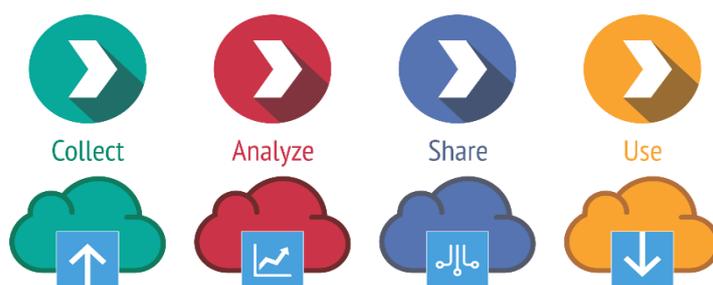
Before explaining the key steps to mobilize the data community for enabling sustainable development indicators to be measured and tracked, it is crucial to understand the data value chain. A key product is “Total Weather Insurance”, an insurance offering that pays farmers automatically and without proof of loss for bad weather that may impact their profits.

Figure 11 shows a typical value chain of data/information which starts from data collection, subsequently analyzing and sharing finally, using it. Breakdowns in generating and using data can occur at different stages of this value chain. For instance, some SDG indicators may not be monitored because data is not collected, because a traditional approach to collecting this data is very expensive (problem occurs at the ‘collect’ stage). An example of data collection on malaria in Uganda using SMS technology is the one of the best

examples how innovation can help improve action against malaria, by addressing a problem at the data collection stage. Another example, Climate Corp, acquired for \$930 million by Monsanto in October 2013, uses 60 years of detailed crop yield data, weather observations from one million locations in the United States and 14 terabytes of soil quality data - all free from the US Government - to provide applications that help farmers improve their profits by making better informed operating and financing decisions. A key product is “Total Weather Insurance”, an insurance offering that pays farmers automatically and without proof of loss for bad weather that may impact their profits.

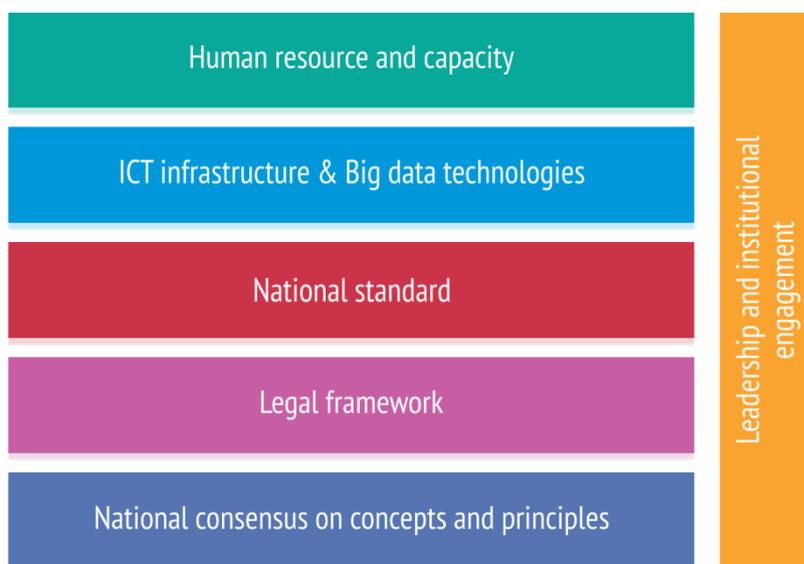
The Mtrac programme in Uganda uses SMS surveys completed by health workers to alert officials to outbreaks of malaria, and lets them know how much medicine is on hand at health facilities, so they can anticipate and resolve any shortages. Before Mtrac, the Ministry of Health had very little health facility-level data, either paper or electronic. Now they are collecting data from thousands of health facilities, capturing and analyzing results within 48 hours at a cost of less than US\$150 per poll.

Figure 11- Data/Information Value Chain



Founded by two ex-Google engineers in 2006, Climate Corp uses three million new data points a day from 22 datasets using advanced analysis techniques. The data comes from a range of third-party providers such as the US National Weather Service, which publishes its data free for re-use. This is a great example how “data sharing” stage can help to produce more innovation.

Figure 12 - Key pillars for successful data revolution



In order for the data/ information chain to work, six core pillars of data/ information infrastructure that necessary, as shown in Figure 12.

The first pillar is national consensus on the key concepts and principles. It is important that decision-makers understand the phenomena of big data, open data and data revolution taking place both globally and in Mongolia, and how these phenomena can be harnessed for monitoring sustainable development.

The second pillar is a legal framework which carefully considers sensitive aspects such as data privacy and human rights on the one hand, and removes blocks, provides incentives and supports mechanisms to stimulate data sharing on the other hand.

The third pillar is a national standard to provide a common language to make data to be understood between different stakeholders or systems to enable collaborations, interoperability,

data exchange and consistency between data of relevant stakeholders, including in the public and private sectors.

The fourth pillar is ICT infrastructure and big data technologies.

The fifth pillar is human resources with required skills and capacity.

The sixth pillar is leadership and institutional engagement, which is required at the all other pillars. Leadership and institutional engagement is the key driver for each one of these layers. Particularly, the leadership from the NSO and its engagement is most important.

5.2.1 The Legal Framework

Key legal issues with respect to data and big data are: 1) Access to information, where laws and regulations concern the right to information of individuals, legal entities, researchers and civil society organizations to develop, process, summarize, analyze, report, deliver to users, and utilizing statistical and other data produced by government institutions; 2) Confidentiality and privacy, where laws and regulations concern the protection of confidentiality of the government, organizational and privacy of individuals; and 3) personal information protection and electronic data issue.

Many countries adopt access to information laws, which provide citizens, permanent residents or any person (or entity) the legal right to obtain information, in any form, that is under the control of a government institution. The general purpose of these acts is to make government more open and transparent, allowing citizens to more fully participate in the democratic process. For example, The *Access to Information Act of Canada* gives individuals a right to access records under the control of a federal government institution in accordance with the principles that government information should be available to the public, that necessary exceptions to the right of access should be limited and specific and that decisions on the disclosure of government information should be reviewed independently by government. Any person may make a request under the *Access to Information Act* for information under the control of Citizenship and Immigration Canada.

Mean concept of the privacy laws of the other countries to protect the privacy of individuals with respect to personal information about themselves held by a government institution and provides individuals with a right to access and request correction to this information. The personal information can only be used in accordance with the purpose for which the information was collected or for a use consistent with that purpose. Information protected by the privacy law can

only be disclosed with the consent of the person to whom it relates or in accordance with some exception terms (for example, the personal information under the control of a government institution may be disclosed to the prosecutor office, court or investigative body by the law etc.). *The Federal Information Security Management Act 2002* is United States legislation that defines a comprehensive framework to protect government information, operations and assets against natural or man-made threats. FISMA was signed into law part of the *Electronic Government Act of 2002*. FISMA assigns responsibilities to various agencies to ensure the security of data in the federal government. The act requires program officials, and the head of each agency, to conduct annual reviews of information security programs, with the intent of keeping risks at or below specified acceptable levels in a cost-effective, timely and efficient manner.

Many countries adopt the laws to support and promote electronic commerce by protecting personal information that is collected, used or disclosed in certain circumstances, by providing for the use of electronic means to communicate or record information or transactions. For example, the *Information Technology Act 2000, India* provides legal framework for electronic governance by giving recognition to electronic records and digital signatures. The formation of Controller of Certifying Authorities was directed by the Act, to regulation issuing of digital signatures. It also defined cyber-crimes and prescribed penalties for them. It also established a Cyber Appellate Tribunal to resolve disputes arising from this new law.

Below is the short review of the current legislation in Mongolia related to data and information.

1. LAWS OF MONGOLIA RELATED TO ACCESS TO INFORMATION

Law on Information transparency and right to information (2011) provides citizens or any person (or entity) the legal right to obtain information from the government organizations. In accordance with this law all ministries, agencies, organizations established by the Parliament, fully or partially state-owned entities Government organizations shall place to their web pages and ensure the transparency of following information:

- activities;
- human resources
- budget and finance; and
- procurement of goods, works and services with state and local funds.

Individuals and legal entities are entitled to access to following information, unless prohibited by laws:

- all information related to the government organizations' news, documents and contracts;
- information related to their assets; and
- other information related to government organizations' activities.

Since 2011, Independent Authority against Corruption (IAAC) Mongolia organizes independent evaluation on how does work this law. Independent reports show that most of governments organizations are making the progress from time to time, but fully or partially state-owned entities are mostly do not meet the transparency requirements of the law. Some government institutions such as General Judicial Counsel, General Prosecutor's Office, IAAC, Secretary of Parliament, Secretary of the Cabinet and President' office are not included in such evaluation process. In our opinion, these highest organizations should lead transparency approach among other organizations. These provisions of the law do not work. For example, according to this law, in the procurement process information why the winner was win or why the other applicants were won should be placed on the web site of the government organization. Often this kind of information is not accessible. Any person may make a request under this law to get the information, which is not a secret. But in the practice, officials of some government organizations are too cautious when providing information due to occurrence of loss of information. The reason could be: (a) sanctions for disclosing secret information are not clearly regulated by the law; and (b) regulations on protection of information still is not clear. So the law needs to be amended.

Law on Glass Accounts (2015). The Law requires making the information related to budgets and finances of government organizations, such as Ministry of Finance, all government organizations, fully or partially state-owned entities, fully transparent. All government organizations and fully or partially state-owned entities publish their financial information on their web sites. According to the mass media an social world, start of implementation of this newly adopted law is good and any person can see money transactions above 5 mln. tugriks (approx. USD 2500).

Statistics Law (1997) gives legal basis for the NSO to produce official and impartial statistics, manage and coordinate official statistics in Mongolia, with participation of all ministries, other government organizations, all levels of governors (province, district and sub-district), maintain data confidentiality, and provide users with valid statistical data. NSO's function on searching unofficial data and statistics, cooperating with individuals and legal entities possessing such data

and utilizing for their assessment and analysis are not regulated sufficiently. The Statistics Law needs to be updated, just to conclude from the analysis made on big data, including; (a) NSO right to use other resources and non-official data: research reports, metadata, contracted person etc. (b) clear regulation on duties of government organizations and officials who have access to secret information; (c) name secrecy, processing; (d) purpose of use of information; (c) informed consent etc.

2. LAWS RELATED TO PRIVACY AND CONFIDENTIALITY OF INFORMATION

Law on State Secrets (1995) defines list of information that is considered as state secret. For example, those information which concerns national security, defense, intelligent activities, citizen registration data etc are the state secret. But the law does not define the ways to use citizen registration information without identity of certain person for the statistical purpose, so in practice every government organization require notarized identification card, before delivering some service. Also, issues of protection of electronic information has not been regulated. So, we recommend to amend this law.

Law on Organizations' secrets (1995) regulates the issue of organizations secret of all legal entities – public and private. In accordance with this law, organizations shall define themselves what they deem as secret information. In practice it is difficult to get the information for the research purpose. It is necessary to clearly define which kind of information can be organizational secret and it is necessary to introduce new regulations, such as processing secret information and using such information without revealing names for the research and statistical purpose. Also still unclear the procedure of protection of confidentiality of electronic information.

Law on Individuals' Secrets (1995). The law says private correspondence, health, property and family information are the individual's secrets. Individual shall protect his/her own secrets. The law does not define the implementing procedure. This law should be changed and include some conceptual regulations, such as utilization of information according to the accessed purpose, informed consent, processing, keeping and using the individuals' information for the purpose of big data revolution.

In Mongolia, there is no any laws, which regulate the relationships concerning e-governance, e-commerce, electronic data processing, security protection of electronic data, except Law on Electronic signature (2011).

To conclude, Government organizations' duties on registration, collection, analysis, assessment, reporting and publishing of information are regulated under other relevant laws. Please see more details on Table 14 SOME LAWS ON CREATING DATABASE AND STATISTICS.

Administrative acts, forms and questionnaires used for taking information are equally important in making the information used to determine and assess SDG indicators. Some information needed to determine some missing indicators could also be obtained by inserting additional indicators to the traditional forms, tables, and regular questionnaires used to obtain information, or by defining more optimally. This issue will be looked at in detail in the Case study section of this report by each indicator.

The three laws regulating Secrets of State, Institutions and Individuals are required to be revised. These laws and the regulations of secrecy adopted thereunder include regulations related to paper information, such as “manager of secret information” shall be appointed, bookkeeping of secret information shall be maintained and such information shall be kept in safe place, the person who accessed such information shall be registered and sign. New regulations are needed in the modern days of IT technology.

In conclusion, we recommend to amend these 3 general laws related to secret information or develop one or several laws upon further research, which should include the following issues:

- clearly define which kind of information is secret
- introduce some procedural regulations such as keeping, processing, using, analyzing and using for decision making process the secret information
- develop the legislation on security of electronic information consistent with international standards considering IT development
- clearly define the sanctions for disclosure an usage of secret information in any ways.

6 CASE STUDIES

6.1 DETAILED STUDY FOR SDG IN HEALTHCARE SECTOR

6.1.1 Health-related indicators in SDGs

Good quality data is essential for decision making in the health sector. To know all the developments in the health sector and to measure all SDG indicators in this sector, Mongolian health sector decision makers are on the way to developing a systematic effort of finding out and measuring necessary data.

The structure of the set of SDGs has implications for policy integration and coherence across areas. For many of the thematic areas covered by the SDGs, targets relating to those areas are found not only under their namesake goal, but across a range of other goals as well. For institutions concerned with monitoring and evaluation of progress under the goals, it will be necessary to look at multiple goals – all those which include targets referring to one institution’s area of interest. This may enable greater integration across goals. To take a concrete example, we look at the area of health. This area is covered by SDG3: Ensure healthy lives and promote well-being for all at all ages, which includes 9 targets (excluding those on means of implementation). In addition, seven targets under goals 2, 6, 11 and 12 also explicitly refer to health in their wording. These targets can be referred to as “extended” targets for SDG3, as opposed to “core” targets listed under SDG3. The combined list of targets is shown in Table 3. Arguably, institutions concerned with the health sector and operating within the framework of the SDGs will have to consider both core and extended targets when designing, implementing and monitoring policies³.

³David Le Blanc. Toward Integration at Last? The sustainable development goals as a network of targets”. DESA Working Paper No441.

Table 3-"Core" Targets and "Extended" Targets: Example of SDG 3

Rank	Sustainable development goal
"Core" targets: Goal 3. Ensure healthy lives and promote well-being for all at all ages	
3.1	by 2030 reduce the global maternal mortality ratio to less than 70 per 100,000 live births
3.2	by 2030 end preventable deaths of newborns and under-five children
3.3	by 2030 end the epidemics of AIDS, tuberculosis, malaria, and neglected tropical diseases and combat hepatitis, water-borne diseases, and other communicable diseases
3.4	by 2030 reduce by one-third pre-mature mortality from non-communicable diseases (NCDs) through prevention and treatment, and promote mental health and wellbeing
3.5	strengthen prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol
3.6	by 2020 halve global deaths and injuries from road traffic accidents
3.7	by 2030 ensure universal access to sexual and reproductive health care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes
3.8	achieve universal health coverage (UHC), including financial risk protection, access to quality essential health care services, and access to safe, effective, quality, and affordable essential medicines and vaccines for all
3.9	by 2030 substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water, and soil pollution and contamination
"Extended" set of targets: Targets from other goals that directly refer to health	
	Goal 2. End hunger, achieve food security and improved nutrition, and promote sustainable agriculture
2.2	by 2030 end all forms of malnutrition, including achieving by 2025 the internationally agreed targets on stunting and wasting in children under five years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women, and older persons
	Goal 6. Ensure availability and sustainable management of water and sanitation for all
6.1	by 2030, achieve universal and equitable access to safe and affordable drinking water for all
6.2	by 2030, achieve access to adequate and equitable sanitation and hygiene for all, and

	end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations
6.3	by 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater, and increasing recycling and safe reuse by x% globally
	Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable
11.2	by 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons
11.5	by 2030 significantly reduce the number of deaths and the number of affected people and decrease by y% the economic losses relative to GDP caused by disasters, including water-related disasters, with the focus on protecting the poor and people in vulnerable situations
	Goal 12. Ensure sustainable consumption and production patterns
12.4	by 2020 achieve environmentally sound management of chemicals and all wastes throughout their life cycle in accordance with agreed international frameworks and significantly reduce their release to air, water and soil to minimize their adverse impacts on human health and the environment

Source: David Le Blanc, 2015.

Due to limited time and scope of work constraint, we had a look only at targets under Goal 3 this time, because Goal 3 is considered as a goal with most of traditional data available and our aim was to study the availability of traditional data taking example of one specific goal, which was in this case Health sector goal.

6.1.2 Health data and statistics in Mongolia

This case study explores the extent to which non-traditional data can complement traditional data collected by the Ministry of Health, the Health Agency, the Public Health Institute and other government agencies in the health sector for monitoring of health-related Sustainable Development Goal and targets.

Public and private clinics register their data related to ambulance and outpatient service, sickness, death rates and other statistics on a daily basis and report online and by paper by filling out special forms to the Ministry of Health monthly. Family and soum health centers, inter soum hospitals, aimag, districts medical centers and private hospitals should report each and every case of suspect for transmissible diseases to their province or district health department every

Monday. Tuberculosis and cancer cases must be reported to aimag and capital health department as soon as it's confirmed. (450th Order of the Minister for Health, 2013).

There are 26 indicators in the health sector in frame of Mongolia SDG, of which 15 indicators are available from existing, traditional data sources described above. The Table below shows all of 26 health indicators and makes visible which of those indicators are available from traditional data sources, which need to be additionally assessed and researched, and which indicators need non-traditional data sources.

Table 4 - Overview of SDG Health Indicators

3.1.1 Maternal mortality ratio
3.1.2 Proportion of births attended by skilled health personnel
3.2.1 Under-five mortality rate
3.2.2 Neonatal mortality rate
3.3.1 Number of new HIV infections per 1,000 uninfected population, by sex, age and key populations
3.3.2 Tuberculosis incidence per 1,000 population
3.3.3 Malaria incidence per 1,000 population
3.3.4 Hepatitis B incidence per 100,000 population
3.3.5 Number of people requiring interventions against neglected tropical diseases
3.4.1 Mortality rate attributed to cardiovascular disease, cancer, diabetes or chronic respiratory disease
3.4.2 Suicide mortality rate
3.5.1 Coverage of treatment interventions (pharmacological, psychosocial and rehabilitation and aftercare services) for substance use disorders
3.5.2 Harmful use of alcohol, defined according to the national context as alcohol per capita consumption (aged 15 years and older) within a calendar year in liters of pure alcohol
3.6.1 Death rate due to road traffic injuries
3.7.1 Proportion of women of reproductive age (aged 15-49 years) who have their need for family planning satisfied with modern methods
3.7.2 Adolescent birth rate (aged 10-14 years; aged 15-19 years) per 1,000 women in that age group
3.8.1 Coverage of essential health services (defined as the average coverage of essential services based on tracer interventions that include reproductive, maternal, newborn and child health, infectious diseases, non-communicable diseases and service capacity and access, among the general and the most disadvantaged population)
3.8.2 Number of people covered by health insurance or a public health system per 1,000 population
3.9.1 Mortality rate attributed to household and ambient air pollution
3.9.2 Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services)
3.9.3 Mortality rate attributed to unintentional poisoning
3.a.1 Age-standardized prevalence of current tobacco use among persons aged 15 years and older
3.b.1 Proportion of the population with access to affordable medicines and vaccines on a sustainable basis
3.b.2 Total net official development assistance to medical research and basic health sectors
3.c.1 Health worker density and distribution
3.d.1 International Health Regulations (IHR) capacity and health emergency preparedness

Reference:

- Available from traditional data source
- Needs to be assessed and researched
- Needs non-traditional data source

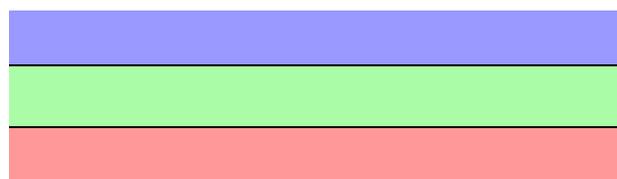


Table 5-Classification of Health Indicators by Source Type

Nº	Calculation possibilities	Quantity (%)	Indicators Code
1.	Ready to be assessed using traditional approach	16 (60.0%)	3.1.1., 3.1.2., 3.2.1., 3.2.2., 3.3.1., 3.3.2., 3.3.3., 3.3.4., 3.4.1., 3.4.2., 3.6.1., 3.7.1., 3.7.2., 3.9.3., 3.a.1., 3.c.1., 3.d.1.
2.	Additional research should be done to calculate these indicators	2 (8%)	3.7.1., 3.d.1.
3.	Required non-traditional data approaches including Big data usage and high technology	8 (32.0%)	3.5.1., 3.5.2., 3.8.1., 3.8.2., 3.9.1., 3.9.2., 3.b.1., 3.b.2.
	Total	26 (100.0)	

To summarize, upon having analyzed 26 health sector indicators, we came to a conclusion that 16 of them or 60% of these indicators can be calculated every quarter or every year by widening or improving reporting forms provided by the Ministry of Health or the NSO to collect data from primary hospitals (soum, aimag and district level). Also adding some new reports to collect data available in soum and district level (but which are not covered currently through existing forms) would add good amount of missing data into the health sector. It means that the use of existing potential in full through adding a little effort and “out-of existing-box” thinking is very important. The following 2 health indicators can be calculated through conducting existing NSRO surveys on a more frequent basis (yearly surveys)

- 3.7.1. NSOs covering women using modern contraception aged 15-49, conducted every 5 years;
- 3.d.1. Calculate the potential of implementing international health insurance and public health readiness during emergency situation indicators using the standard evaluation research index of duty to report WHO every year;

8 important health indicators will be calculated using non-traditional sources and approach within the framework of the Mongolian Sustainable Development Program. Those indicators are not included in the official health statistics, there is still no definition of those indicators, and calculation methods are still not defined. Also calculation of those indicators requires participation/data from other sectors. The following table shows why these indicators cannot be

estimated currently using traditional data sources and what's the reason of utilizing non-traditional approach or non-traditional sources to calculate them.

Table 6-Reasons for Using Non-traditional Data

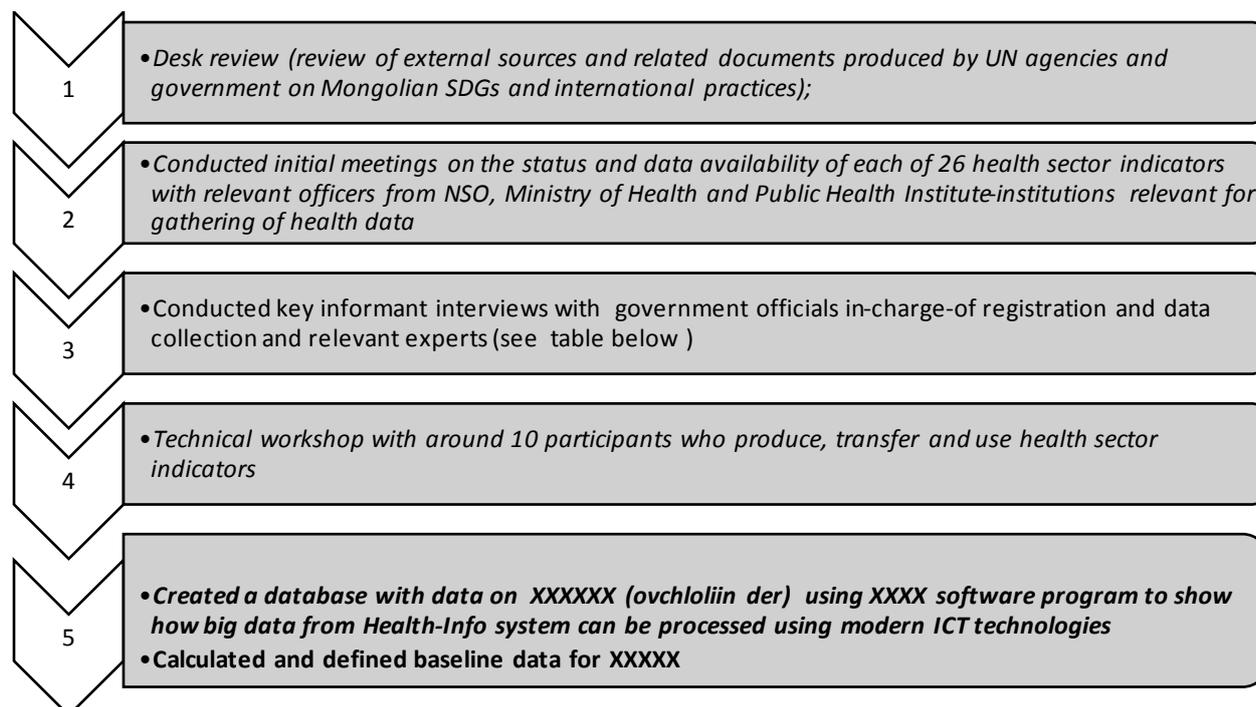
№	Indicators	Reason why these indicators cannot be calculated in traditional way
1.	3.5.1. Coverage of treatment interventions (pharmacological, psychosocial and rehabilitation and aftercare services) for substance use disorders	<ul style="list-style-type: none"> – There is no true number of drug users in Mongolia – The National Center for Mental Health reports only the number of people who were treated at the centre – Most of substance users do not turn to hospitals for treatment\support but connect to NGOs, churches or police.
2.	3.5.2. Harmful use of alcohol, defined according to the national context as alcohol per capita consumption (aged 15 years and older) within a calendar year in litres of pure alcohol	<ul style="list-style-type: none"> – The definition of “how much alcohol is harmful” should be introduced first – The total volume of alcohol produced in Mongolia (transferred to certain alcohol percentage) or imported should be calculated – Statistics on produced and imported alcohol are not available at the Ministry of Health and should be obtained from the NSO, the Tax Authority and other sources
3.	3.8.1. Coverage of essential health services (defined as the average coverage of essential services based on tracer interventions that include reproductive, maternal, newborn and child health, infectious diseases, non-communicable diseases and service capacity and access, among the general and the most disadvantaged population)	<ul style="list-style-type: none"> – Although there are instructions and standards on early newborn critical care, infectious disease and essential care, there are no reports and evaluations of those standards from official sites – There is no common understanding or definition of non-contagious diseases and essential health services – Needs to clarify whether essential health services are relevant to primary or secondary level health institutions;
4.	3.8.2. Number of people covered by health insurance or a public health system per 1,000 population	Number of people with state health insurance scheme can be obtained from the Social Security Authority, but the number of people with local and international private health insurance coverage is not accessible yet.
5.	3.9.1. Mortality rate attributed to household and ambient air pollution	<ul style="list-style-type: none"> – Mortality statistics does not include domestic and outdoor air pollution as a cause of death – There is still no consensus in Mongolia which illnesses can be considered as caused by air pollution – There is no system which receives data and reports

		<p>of indoor and outdoor environmental pollution.</p> <ul style="list-style-type: none"> – There is no consensus in Mongolia as to which of 99 types of respiratory diseases (J00-J99) and 99 types of circulatory system diseases (I00-I99) according to the International Classification of Diseases, can be considered as caused by outdoor and indoor air pollution.
6.	3.9.2. Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services)	<ul style="list-style-type: none"> – There is limited possibility for prompt exchange and analysis of data between different sectors – There is no system which provides analysis on the purity of drinking water – There is no consensus in Mongolia which illnesses can be considered as caused by unsafe Water, Sanitation and Hygiene
7.	3.b.1. Proportion of the population with access to affordable medicines and vaccines on a sustainable basis	<ul style="list-style-type: none"> – Still no definition as to what is “affordable drugs and medicine” – No definition on “access” to medicines: what is “good access” and how “far” one needs to travel to have a good access to medicine. – Voluntary vaccination is done by private clinics as well. It is still not clear whether authorities collect those data from private clinics to calculate vaccination rates – Mapping of clinics and pharmacies in Mongolia and their distance to nomads living in rural areas is not available
8.	3.b.2. Total net official development assistance to medical research and basic health sectors	There is still no unified official statistics on official development assistance to medical research.

6.1.3 Selection of Eight Health Indicators Requiring Non-Traditional Data

The assessment of health sector indicators, in order to identify how we can get data using non-traditional data sources, employed a mixture of quantitative and qualitative methods:

Figure 13-List of Activities Undertaken



Also detailed study of Information Value-Chain in the health sector was undertaken to identify where the gap happened which led to the non-availability of data:

Databases and software programs reviewed and used during the assessment of health data are listed in Table 9. Face-to-face meetings with 15 data stakeholders and informants were conducted.

The eight indicators which are not covered by traditional approach and need further non-traditional data and approach to be calculated, are listed below. We use a summary template which briefly presents all necessary basic data about the indicators like:

- How frequent data is collected?
- Who is the key owner of data?
- What definition is used for this particular indicator, whether this is international, globally used definition or locally developed definition?
- How the data can be disaggregated?
- Which calculation method is used for calculating the indicator?
- Whether the indicator is available, and if not, why?
- Where and how we can obtain the data?
- At which stage of data problem arises by information value chain analysis?
- Which action is required to solve the data problem and calculate the indicator?

1. Coverage of Treatment Interventions for Substance Use Disorders

Name	3.5.1. Coverage of treatment interventions (pharmacological, psychosocial and rehabilitation and aftercare services) for substance use disorders
Frequency	Every year: the number of patients covered in treatment for substance use disorders in present year
Key owner	Ministry of Health
Definition	Narcotic drug (pharmacological, psychosocial and rehabilitation and aftercare services) treatment interventions (pharmacological, psychosocial and rehabilitation and aftercare services) coverage percentage
Dis-aggregation	<ul style="list-style-type: none"> • Age, sex, education level, employment, location • By treatment type (medicine, psychology, rehabilitation and monitoring)
Calculation method	$\frac{\text{Number of patients involved in the treatment for drug use disorder for present year}}{\text{Total number of drug users}} \times 100\%$
Status of availability	It is possible to get statistic information from the Statistics Department of National Center for Mental Health regarding the number of people involved in the substance use disorder treatment
Root cause if not availability	<ul style="list-style-type: none"> – There is no defined total number of drug users in Mongolia (by type of substance); – Official health statistics do not cover the number of patients covered in treatment for substance use disorders in present year in clinics outside of National Centre for Mental Health (by this information is available in every health department). Also people registered at Police departments and NGOs working with people with disorders are not registered
Preferred date source	<ul style="list-style-type: none"> – The number of patients covered in treatment for substance use disorders in ... Levels of state owned clinics and hospitals. – The number of patients covered in treatment for drug use disorders in private clinics
Other Potential data	<ul style="list-style-type: none"> – Profound research is needed to determine the total number of people with substance use disorder in Mongolia – Statistical report of drug crime unit of General Police Department – Unit registering system: statistical reports of NGOs (Association to Protect Population from Drug and Opium) working with people with substance use disorders –
Information value chain-at which stage data problem arises?	<ul style="list-style-type: none"> -Data collection -Data validation -Data analysis
Action	– To formulate guideline and standard of treatment for drug use disorders in

Required	<p>National Center for Mental Health (drug and psychological recovery and tracking services)</p> <ul style="list-style-type: none"> – Implement a project that supply disposable syringe and give opioid substitution therapy to opioid dependent people in poor countries. This method will allow to gather together people with disorders and get the total number of users – To specify the number of patients covered in pharmacological, psychosocial and rehabilitation and aftercare service drug use disorder treatment – To undertake a nationwide survey on defining the total number of people with substance use disorder – To develop a database of drug users in Mongolia – Approve financing for the survey and database in the state Budget – Cooperation agreement between Ministry of Health, General Policy Department, private hospitals and NGOs on data exchange regarding people with substance use disorders
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2. Harmful Use of Alcohol, Defined According to the National Context as alcohol per Capita Consumption

The indicator is defined and calculated by the method presented in Appendix XXX and reported into non-contagious disease surveillance system of WHO from the countries involved.

As these concepts and definitions have been already launched and used in other countries, this should be used directly in Mongolia.

Name	3.5.2. Total (recorded and unrecorded) alcohol per capita (APC) (15+ years old) consumption within a calendar year in liters of pure alcohol
Frequency	Every year
Key owner	The priority of data sources for recorded alcohol per capita consumption should be given to government statistics on sales of alcoholic beverages during a calendar year or data on production, export and import of alcohol in different beverage categories.
Definition	<p>Consumption of pure alcohol (ethanol) in litres per person aged 15+ during one calendar year.</p> <ul style="list-style-type: none"> – main categories of alcohol beverages “Beer” includes malt beers, “Wine” includes wine made from grapes, “Spirits” include all distilled beverages, and “Other” includes one or several other alcoholic beverages, such as fermented beverages made from sorghum, maize, millet, rice, or cider, fruit wine, fortified wine, etc.
Dis-aggregation	<ul style="list-style-type: none"> • Age, sex, other relevant socio-demographic stratifies where available • Types of Alcoholic Beverages (beer, wine, spirit, other)

Calculation method	$\frac{\text{Sum of recorded and unrecorded alcohol consumed in a population during a calendar year}}{\text{Midyear resident population aged 15 + for the same calendar year}}$ <p>Numerator: Sum of recorded and unrecorded alcohol consumed in a population during a calendar year, in litres.</p> <p>Denominator: Midyear resident population aged 15+ for the same calendar year.</p>
Status of availability	Currently not available.
Root cause if not availability	<ul style="list-style-type: none"> – Alcohol production data of alcohol producers is not officially collected by NSO – Import data from alcohol beverage importers is not officially collected – Alcohol consumption data is not registered using traditional (statistical) and non-traditional (sales data from big supermarkets, wholesalers etc) sources of data.
Preferred date source	<ul style="list-style-type: none"> – Production data from national alcohol producers – Alcohol products import data from Customs Agency – Alcohol production data from Tax Authority
Other Potential data	<ul style="list-style-type: none"> – Alcohol sales data from big trade chains, supermarkets, wholesalers etc – FAOSTAT data, other data sources such as customs or police data, and expert opinions.
Information value chain-at which stage data problem arises?	<ul style="list-style-type: none"> -Data collection -Data validation -Data analysis -Data sharing
Action Required	<ul style="list-style-type: none"> – Consensus should be made on the definition of the alcohol measurement unit in Mongolia – Cooperation with government ministries like Ministry of Agriculture and Industry and agencies like Customs office or Tax Authority on obtaining data of alcohol production and import in Mongolia – NSO should come to consensus which data should be considered as reliable and useful for calculating the alcohol consumption – There should be official cooperation agreement between different government institutions which regulates the information and data exchange between different government institutions (alcohol production data, import data etc)

Source: NCD Global monitoring framework: Indicator definitions and Specifications

3. Coverage of Essential Health Services

This indicator includes coverage of essential health care services for following sub- sectors:

- Reproduction
- Mothers and infants
- Child health
- Contagious diseases
- Non-contagious diseases

The guideline of mothers and infants’ essential health services is developed frequently in the health sector. But there is no methodology for evaluating the coverage of essential health services for infants and children and reporting to health statistics on the national level.

Name	Essential medicines and technologies for NCD
Frequency	At least every 3 years
Key owner	Ministry of Health
Definition	Essential health care coverage (reproduction, infant and child health, infectious and non-infectious diseases etc.)
Dis-aggregation	<ul style="list-style-type: none"> • Cities and rural areas • Types of Services (infant and child health, infectious diseases and non-infectious diseases etc) • Public, Private sector
Calculation method	$\frac{\text{Number of facilities that have all essential medicines and basic technologies from the minimum list available}}{\text{Number of surveyed facilities}} \times 100$
Status of availability	Not available.
Root cause if not availability	There is no packaged service and monitoring and evaluation for these packages for reproduction, mothers, infants, children health care, contagious diseases and non-contagious diseases essential health care services
Preferred date source	– Availability and affordability of quality, safe and efficacious essential medicines, including generics, and basic technologies in both public and private facilities.
Other Potential data	<ul style="list-style-type: none"> – Number of surveyed facilities – Nationally-representative health facility assessment
Information value chain-at which stage data problem arises?	<ul style="list-style-type: none"> -Data collection -Data validation -Data analysis
Action Required	– Develop common understanding and common definition of terms like who is most disadvantaged population, what are most essential health care

	<p>services etc and come to consensus on it:</p> <ul style="list-style-type: none"> ○ Most disadvantaged population ○ Essential health services for mother and infants ○ Essential health services for children ○ Essential care of infectious diseases ○ Essential care of non-infectious diseases <p>– Standardize and monitor the reproduction, mothers, infants, children health care, contagious diseases and non-contagious diseases essential health care services;</p> <p>– Create a system of official health statistics integration;</p>
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Example: Non-communicable diseases (NCD)

During the assessment, a number of facilities did have the minimum list of essential medicines and basic technologies available. The minimum list includes medicines - at least aspirin, statin, an angiotensin converting enzyme inhibitor, thiazide diuretic, a long acting calcium channel blocker, a beta-blocker, metformin, insulin, a bronchodilator and a steroid inhalant.

Technologies - at least a blood pressure measurement device, a weighing scale, height measuring equipment, blood sugar and blood cholesterol measurement devices with strips and urine strips for albumin assay.

Also, the common concept of most disadvantaged population (disabled people, non-addressed children, pregnant woman and elders) should be defined. Primary health care institutions should standardize most essential health care service of reproduction, mothers and infants health, contagious and non-contagious diseases and should evaluate result frequently once in 3 years.

4. Number of people covered by health insurance or a public health system per 1000 population

Name	Health Insurance Coverage (Per 1000 population)
Frequency	Every year
Key owner	National Statistics Office
Definition	Population health insurance coverage (Per 1000 population)
Dis-aggregation	Domestic and foreign health insurance
Calculation method	$\frac{\text{Number of people covered by state health insurance} + \text{number of people covered by private health insurance}}{\text{Total population}} \times 1000$
Status of availability	Number of people covered by State Health insurance Scheme is available
Root cause if not available	<ul style="list-style-type: none"> – Number of people covered by private local insurance – International health insurance is not covered

Preferred date source	<ul style="list-style-type: none"> – National Social Security Authority which provides data on all people covered by the state owned health insurance scheme – Health department’s statistics of social insurance office of Ministry of Population Development and Social Protection
Other Potential data	<ul style="list-style-type: none"> -Financial Regulatory Commission (FRC) has data on all private domestic and international health insurance policies sold in Mongolia -Local insurance companies and insurance brokers have information on number of private health insurance policies sold within a year
Information value chain-at which stage data problem arises?	<ul style="list-style-type: none"> -Data collection -Data sharing
Action Required	<ul style="list-style-type: none"> -To request information from FRC on number of policy holders of international and local health insurance policies -Agreement between FRC, Social Security Authority and FRC on exchange of data on state and privately insured

5. Mortality Rate Attributed to Household and Ambient Air Pollution

Name	Mortality rate attributed to household and ambient air pollution
Frequency	Every year
Key owner	Ministry of Health
Definition	Mortality rate attributed to household and ambient air pollution. Probability of dying from lung cancer, chronic obstructive pulmonary disease (COPD) and ischemic heart disease and stroke. Deaths from these four causes will be based on the following ICD codes. (See calculation methods)
Dis-aggregation	By state, region, aimag, city
Calculation method	<p>Total number of death cases caused by lung cancer C46.50, chronic obstructive pulmonary disease J44 (COPD) and ischaemic heart disease I11 and stroke Z82.3, acute lower respiratory infection of children under 5 over average population of the year and multiply by 10000</p> $M_x = \frac{\text{Total deaths from diseases} (C46.50 + J44 + I11 + Z82.3 + J22)}{\text{Total population}} \times 10000$
Status of availability	Death statistic is available by international system at MoH
Root cause if not available	Death statistics are available by international system but death cases caused by 5 diseases mentioned above are not specified as related to air pollution
Preferred date	– Statistics on above mentioned 5 diseases and mortality rate related to

source	<p>them</p> <ul style="list-style-type: none"> - Population mortality report
Other Potential data	N/A.
Information value chain-at which stage data problem arises?	<ul style="list-style-type: none"> -Data collection -Data validation -Data analysis
Action Required	<ul style="list-style-type: none"> - Ministry of Health should come to consensus and make a resolution which officially recognizes that deaths caused by the above mentioned diseases will be considered as caused by household and ambient air pollution - specify and reprocess death cases caused by lung cancer, chronic obstructive pulmonary disease (COPD) and ischemic heart disease and stroke and acute lower respiratory infection - organize training program for physicians and hospital staff to improve diagnosis of lung cancer, chronic obstructive pulmonary disease (COPD) and ischemic heart disease and stroke and acute lower respiratory infection - organize training program to register death cases (lung cancer, chronic obstructive pulmonary disease (COPD) and ischemic heart disease and stroke and acute lower respiratory infection) by international system - Regulate and integrate Mongolian sustainable development indicator framework health statistics - To hire local watchman to measure particle pollution in every Aimag; - To study the possibility of monitoring day-to-day Health statistics and day-to-day reports of Meteorological and Environmental Monitoring Institution of the Ministry of Environment and Green Development's air pollution information simultaneously and establish correlation between changes in health data and air pollution volume.

6. Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene for all (WASH)

Name	Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services)
Frequency	Every year
Key owner	Ministry of Health
Definition	Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene
Dis-aggregation	States, Regions, Provinces and Capital Sex, other relevant socio-demographic stratifies where available
Calculation method	Total number of children under 5 of present year under death cases of children under 5 caused by Infectious diarrhea, Cholera, Salmonellosis, Shigellosis, Typhoid, Hepatitis A, Other bacterial, protozoal and viral intestinal disease of present year and multiply by 10000 <i>Mx</i> $= \frac{\text{Total deaths from for diseases (Diarrhoea + Cholera + Schistosomiasis + Hepatit A + etc)}}{\text{Total population}} \times 10000$
Status of availability	Mortality data collected on International classification of diseases
Root cause if not availability	– Mortality rate attributed to unsafe water, unsafe sanitation, lack of hygiene is not calculated in Mongolia
Preferred date source	– Statistics and Reports of National Center for Contagious Diseases
Other Potential data	N/A
Information value chain-at which stage data problem arises?	-Data collection -Data validation -Data analysis
Action Required	<ul style="list-style-type: none"> – Ministry of Health should come to consensus and make a resolution which officially recognizes that deaths caused by the above mentioned diseases will be considered as caused by unsafe water, unsafe sanitation and lack of hygiene – Diseases and mortality attributed to unsafe water, unsafe sanitation, lack of hygiene needs to be compared, differentiated and reprocessed – Organize training for doctors, hospital staffs to improve disease diagnosis attributed to unsafe water, inadequate sanitation and lack of hygiene – Health statistic specifically needs to be directed and integrated for the context of sustainable development criteria in Mongolia;

7. Proportion of the population with access to affordable medicines and vaccines on a sustainable basis (Code 3.b.1)

Name	Proportion of the population with access to affordable medicines and vaccines on a sustainable basis
Frequency	Once in 3 years
Key owner	Ministry of Health
Definition	The proportion of population with access to <i>affordable, essential drugs and vaccines</i> on a sustainable basis is the share of the population that has essential medicines continuously available and affordable at public or private health facilities or medicine outlets that are within one hour's walk from the homes of the population.
Dis-aggregation	<ul style="list-style-type: none"> – The indicators on availability and price can be disaggregated in a number of ways. Two major ones are the split between public and private health facilities, and the split between originator brand and generic medicines. Depending on the survey size, it might be possible to report urban and rural areas separately. – Public, private sector
Calculation method	<ol style="list-style-type: none"> 1. Average availability of 30 selected essential medicines in public and private health facilities, reported as the percentage of medicine outlets where medicine was found on the day of the survey. 2. Median consumer price ratio of 30 selected essential medicines in public and private health facilities. Consumer price ratios are calculated as the ratio between median unit prices (e.g. price per tablet) and Management Sciences for Health (MSH) median international reference prices for the year preceding the survey. MSH international reference prices are used as a comparator as they are widely available, updated frequently, and relatively stable over time. They represent median prices of high quality multi-source medicines offered to developing and middle income countries by different suppliers. Data are unadjusted for differences in MSH reference price year used, exchange rate fluctuations, national inflation rates, variations in purchasing power parities, levels of development or other factors. 3. Margin or mark-up (as a percentage) between producer and consumer price. Cumulative mark-up percentage is calculated by comparing the final medicine price to the manufacturer's selling price or the import cost, insurance and freight price. 4. Existence and year of last update of a published national medicines policy. An official updated national medicines policy (NMP) is recorded as existing when the country has an official NMP document that has been updated within the last 5 years. 5. Existence and year of last update of a published national list of essential medicines. An updated essential medicines list is recorded as existing when the country has a list of essential medicines that has been updated within the last 5 years.

	<p>6. <i>Legal provisions to allow/encourage generic substitution in the private sector expressed as a yes/no indicator.</i></p> <p>7. <i>Public and private per capita expenditure on medicine, available from National Health Accounts</i></p> <p>8. <i>Percentage of population covered by health insurance. This indicator is included in some surveys, but is not routinely collected</i></p> <p>9. <i>Access to essential medicines/technologies as part of the fulfilment of the right to health, recognized in the constitution or national legislation.</i></p>
Status of availability	Not available.
Root cause if not available	<ul style="list-style-type: none"> – No definition of what is “affordable medicine” in Mongolia – No definition of what is “good access” to medicine – No definition of what is good access on “sustainable basis”. <p>All these definitions should be clearly defined and Ministry of Health should come to consensus regarding these definitions and then it can be measured.</p>
Preferred date source	<ul style="list-style-type: none"> – Medicine and vaccine sales data from all state owned pharmacies in every city, aimag and soum – Medicine and vaccine sales data from all private pharmacies in every city, aimag and soum – Sum health center’s drug revolving fund, Pharmaceutical suppliers, Pharmacy
Other Potential data	<ul style="list-style-type: none"> – Import data on drug import – Drug production data from the local drug producers – Statistics and sales data of of Pharmaceutical supply companies
Information value chain-at which stage data problem arises?	<ul style="list-style-type: none"> -Data collection -Data validation -Data analysis
Action Required	<ul style="list-style-type: none"> – Come to consensus on major definitions for this indicator and make it official at the Ministry level – Make lists of essential medicine and vaccines and Calculate funds that conduct availability study once in 3 years – To train , inform and advertise population with essential drug list of family pharmacies; – Create a map with all pharmacies (private and state-owned) and their

	<p>distance to closest soums and bags (smallest administrative unit in Mongolia)</p> <ul style="list-style-type: none"> – Develop collection method and officially collect and analyse databases;
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8. Total Net Official Development Assistance to the Medical Research and Basic Health Sectors

Name	3.b.2. Total net official development assistance to the medical research and basic health sectors
Frequency	Every year
Key owner	National Statistics Office
Definition	Total net official development assistance (ODA) to the medical research and basic health sectors is currently measured by the gross disbursements of total ODA from all donors to medical research and basic health sectors
Dis-aggregation	This indicator can be disaggregated by donor, recipient country, type of finance, type of aid, health sub-sector, etc.
Calculation method	$\frac{\text{total expence of Medical research} + \text{total expence of basic health sector (tugrik)}}{\text{Total expence of health (tugrik)}} \times 100\%$
Status of availability	Not available.
Root cause if not availability	– No analysis has been made yet, but all information is available
Preferred date source	<ul style="list-style-type: none"> – The Ministry of Finance (value of development assistance from International donor organizations on medical research and basic health sector) – Financial reports of International organizations which provide financial & technical help into healthcare sector (such as, WHO, UNFPA, UNICEF, ADB)
Other Potential data	<ul style="list-style-type: none"> – Report of Product, Copyrighted for Health care – Ministry of Health, Ministry of Education, Culture and Science's Research, Primary Health care Sector's expense – The Ministry of Foreign Affairs (Country Collaborative agreements)
Information value chain-at which stage data problem arises?	<ul style="list-style-type: none"> -Data collection -Data validation -Data analysis
Action Required	<ul style="list-style-type: none"> – Coding the projects (http://www.oecd.org/dac/stats/49819385.pdf see example); – Research a chance of integrating international & domestic financial support statements into the financial report of Ministry of Health annually and create a system of reporting it officially;

6.1.4 Recommendations for Health Sector Indicators

#	RECOMMENDATION	ACTIONS REQUIRED	RESOURCES REQUIRED	IMPLEMENTATION
I. National Consensus on Concepts and Principles				
1)	Reach consensus on main definitions, terms, translations and methodologies to measure each and every indicator	NSO's cooperation with UNDP and other donors on development of terms, definitions, translations and methodologies (formulas) to measure indicators needs consensus between decision makers	NSO Ministry of Health Approval and Resolution	2017 (immediate action, no need for financing)
2)	To evaluate whether Mongolian health care system and its reporting system is in compliance with international standards and practices (especially regarding SDGs) and whether we should follow international definitions and methodologies or should elaborate own methodologies	For each and every indicator, make in-depth analysis of information required on international level and check whether this information is obtainable on a national level, whether the international methodology should be used or new Mongolian methodology should be developed	Ministry of Finance NSO Donor organizations to finance the Evaluation works	2017 (immediate action, requires small financing)
3)	Come to consensus which research and surveys in health sector, undertaken by donor organizations or research institutions, can be considered as official statistics	NSO should review all studies, research and reports in health sector for its quality and outreach to define which of them can be added to official statistics	NSO's Approval and Resolution	2017 (immediate action, doesn't require much financing)

Leadership and Institutional Engagement				
4)	Ensure greater cooperation between different government institutions to assure sufficient exchange of data and information on an official basis	Government's Secretariat office should take a leadership on initiating and ensuring closer data and information exchange between the government institutions on an official basis	Resolution from Government's Secretariat Office and Work Plan on data exchange	2017 (immediate action, no financing is need, just good management is required)
5)	NSO's leading role in ensuring use of non-traditional data sources and methodologies for the future use as official data	New Statistics Law or other legal documents should clearly define what types of non-traditional sources can be considered as official statistics in the future	New Statistics Law or other legal documents	2017 or 2018
6)	"Out-of-Box" thinking and quick and efficient functioning of Ministry of Health to ensure complete collection of different health data obtainable from different databases (18 databases) in health sector	Ministry of Health should regularly update and improve its forms and questionnaires through which it collects data from rural hospitals and primary health centers to ensure that growing need for new types of information is covered.	Timely Resolution and Approval of new forms and formats for data collection	2017 (immediate action, no need for financing)
Legal Framework				
7)	To consider importance of maintaining and improving the privacy of health information	Ministry of Health should issue resolution where health care providers express their commitment to handle personal information of patients and research participants with meaningful privacy protections, including strong security measures, transparency, and accountability.	Ministry of Health	2017 (immediate action)

8)	To revise Resolution No.450		Ministry of Health	2017
9)	To safeguard the security of health data.	<ul style="list-style-type: none"> • Every health care institution should appoint a security officer responsible for assessing data protection needs and implementing solutions and staff training. • Make greater use of encryption and other techniques for data security. • Include data security experts on IRBs. • Implement a breach notification requirement, so that patients may take steps to protect their identity in the event of a breach. 	Approval of relevant laws and regulations which protect data privacy in health sector	2017
National Standard				
10)	To collect the same level of information and data with the same extent from private health care providers	Government Secretariat Office and Ministry of Health should agree on data and information exchange with private sector, offering some advantages to the private sector for letting use their own data	Government Resolution on using data from private sector	2017 (immediate action, no need for financing)
11)	Improve the existing data collection questionnaires and methodologies to comply with new international standards	Health Sector Development Centre, the main government institution responsible for data collection and usage in Health sector should show	Ministry of Health Training, data entry manuals	2017 (immediate action, no need for financing)

		more enthusiasm and initiative and renewing its existing ways of data collection/analysis and use modern and non-traditional tools and methodologies		
12)	Agree on certain international or national standards to collect and enter data in existing IT systems in health sector	Training for health sector data workers/statisticians should be provided to ensure correct data entry to existing databases according to agreed international or national standards	Resolution from Ministry of Health	2017
ICT Infrastructure and Big Data Technologies				
13)	Development of umbrella-database for health sector which makes possible exchange of data and information from one database to another based on the common standard	Ministry of Health to initiate a project on creation of umbrella database for health sector and approach international donors	Budget Allocation for this purpose	2018 (action needs financing)
14)	To strengthen existing health information system with leading Health Info system and 18 different databases at different health institutions more “united”, where systems can exchange information and understand each others’ “language”	Ministry of Health to lead the process of “unification” of different databases through official Approval	Budget Allocation for writing additional codes to make systems speak common “language”	2017 (immediate action with little need of financing)
15)	Use new Big Data initiatives in health sector like “E-health” to collect and make use of more digital data in this sector	Better coordination between different donor projects in health sector is required. World Bank financed E-health project should bring benefits for ADB-financed Health-Info and other IT systems in the sector	Ministry of Finance and Ministry of Health should show leadership in making efficient use of good coordination of donor-funded projects	2017 onward

16)	To add more topics in the current Health-Info system to gather more information related to SDGs	Policy Department of Ministry of Health to issue a resolution on modifying existing information collection forms and include more questions related to SDG related topics	Ministry Approval and Resolution	2017 (immediate action with no financing needed)
Human Resource and Capacity				
17)	Improve human resource and its capacity to collect, store, validate, analyze and share existing data	Regular training of statisticians and data workers in health sector, preparation of successors to ensure smooth know-how transfer of data and IT system management	Health care institutions' internal HR policies	Regularly
18)	Increase number of statistical and data entry workers at every level of health care providers	Increase budget for hiring new personal for health care institutions, especially at country-side level to ensure proper quality of data entry	Budget Approval from the Ministry	2017 onward (requires additional financing from state budget)
19)	Ensure that trained statistical and data personals' turnover is low	As health sector workers are paid very low in comparison to other sectors, it is very difficult to keep people work in this industry for long time. Therefore, incentives in form of paid training, graduate studies and other benefits should be offered from the health institutions	Budget Approval from the Ministry	2017 onward

6.2 DETAILED STUDY FOR SDG IN GOVERNANCE

6.2.1 Current Status of Indicators in Governance

Effective government institutions and systems that are responsive to public needs deliver essential services and promote inclusive growth. In addition, good governance promotes freedom from violence, fear and crime, and helps build peaceful and secure societies with the stability needed to attract and sustain development. The Governance goal has 12 targets and 23 indicators. The Governance Indicators presents on six broad dimensions of governance:

- Voice and Accountability
- Political Stability and Absence of Violence
- Government Effectiveness
- Regulatory Quality
- Rule of Law
- Control of Corruption

Many targets in goal 16 are composite in the sense that they include more than one objective in a single target. To fully measure a target with more than one objective, more than one indicator will be required. Goal 16, in general, is robust and comprehensive enough to cover the core issues necessary for a peaceful society. Measuring Goal 16 will be a challenge, simply because of it is a new goal.

If we look at the indicators carefully, most of the indicators of Goal 16 can be measured by a combination of administrative and survey-based data. Therefore, research organizations, civil society groups, the private sector and citizens should all be empowered to help collect data. However, partnerships between official and non-official data providers should be the new norm. There should be a collective commitment to ensure that there is baseline data for every global indicator as well as for every national indicator. It will require a series of dialogues among government, civil society and academia concerning the most appropriate mix of data sources and methodologies for measuring peace, justice and inclusiveness. The successful monitoring of Goal 16, is not only NSO's duty. What also needed is better collaboration data collectors of government, civil society and academia and the international community and, above all, a mutual trust in the usefulness and reliability of the data collected. It is also important to the implementation and measurement of Goal 16 as well as SDGs to bring together such a diverse group of experts from across the data ecosystem.

Currently, the NSO started pulling data availability to measure 228 Mongolian relevant indicators for Sustainable Development Goals. Hence, based on an assessment of data ecosystem mapping in coordination with SDG indicators, data availability for Goal 16 was studied in a detailed way.

Overall assignment of Goal 16 – Indicators

Overall assessment of Goal 16 – Indicators were done through literacy review, interviews and discussions. The review has allowed to have in-depth study of SDGs particularly, indicators of Goal 16 and its' availability nationally, key data stakeholders and defining of the absence of indicators in national statistics, and the data stakeholders' statistical capacity as well as existence and functioning of the legal framework on the use of data, its' sharing and exchanging among multi-sectoral stakeholders in reporting and decision-making processes.

Stocktaking-Literacy/ desk review: Goal 16 consists of 23 indicators. See Table 7. In the frame of the study of Goal 16, all of the following 23 indicators were analyzed and classified into a) easily available indicators which are green, b) readily and partially available indicators with the requirement of some calculations which are orange c) missing data which mostly requires non-traditional data as well as the integrated data between traditional and non-traditional data sources which are red d) international indicators which are blue. Also, a detailed analysis on a survey methodology for missing indicators has been undertaken and included in frame of the following topic of selection of Indicators are requiring non-traditional data.

Table 7 - Classification of SDG –Goal 16 - Indicators

	INDICATORS
1	16.1.1 Number of victims of intentional homicide per 100,000 population, by sex, age and cause
2	16.1.2 Conflict-related deaths per 100,000 population, by sex, age and cause
3	16.1.3 Proportion of population <u>subjected</u> to physical, psychological or sexual violence in the previous 12 months
4	16.1.4 Proportion of population that feel safe walking alone around the area they live
5	16.2.1 Proportion of children aged 1-17 years who experienced any physical punishment and/or psychological aggression by caregivers in the past month
6	16.2.2 Number of victims of human trafficking per 100,000 population, by sex, age and form of exploitation
7	16.2.3 Proportion of young women and men aged 18- 29 years who experienced sexual violence by age 18
8	16.3.1 Proportion of victims of violence in the previous 12 months who reported their victimization to competent authorities or other officially recognized conflict resolution mechanisms
9	16.3.2 Unsensented detainees as a proportion of overall prison population
10	16.4.1 Total value of inward and outward illicit financial flows (in current United States dollars)
11	16.4.2 Proportion of seized small arms and light weapons that are recorded and traced, in accordance with international standards and legal instruments

12	16.5.1 Proportion of persons who had at least one contact with a public official and who paid a bribe to a public official, or were asked for a bribe by those public officials, during the previous 12 months
13	16.5.2 Proportion of businesses that had at least one contact with a public official and that paid a bribe to a public official, or were asked for a bribe by those public officials during the previous 12 months
14	16.6.1 Primary government expenditures as a proportion of original approved budget, by sector (or by budget codes or similar)
15	16.6.2 Proportion of the population satisfied with their last experience of public services
16	16.7.1 Proportions of positions (by sex, age, persons with disabilities and population groups) in public institutions (national and local legislatures, public service, and judiciary) compared to national distributions
17	16.7.2 Proportion of population who believe decision-making is inclusive and responsive, by sex, age, disability and population group
18	16.8.1 Proportion of members and voting rights of developing countries in international organizations
19	16.9.1 Proportion of children under 5 years of age whose births have been registered with a civil authority, by age
20	16.10.1 Number of verified cases of killing, kidnapping, enforced disappearance, arbitrary detention and torture of journalists, associated media personnel, trade unionists and human rights advocates in the previous 12 months
21	16.10.2 Number of countries that adopt and implement constitutional, statutory and/or policy guarantees for public access to information
22	16.a.1 Existence of independent national human rights institutions in compliance with the Paris Principles
23	16.b.1 Proportion of population reporting having personally felt discriminated against or harassed in the previous 12 months on the basis of a ground of discrimination prohibited under international human rights law

Based on an in-depth analysis, status of 23 indicators are:

1. **Indicators readily available with green color:** Those indicators (2) were considered well defined as well as being already computed.
2. **Indicators available after some effort with orange color:** Data are available, but more computations are required for calculation the indicators (9). For example, “number of victims of intentional homicide per 100,000 population, by sex, age and cause.
3. **Indicator not available with red color:** Some of data is available at government authorities, CSOs and NGOs however, those indicators (10) are lacking much data in order describe full picture of a certain indicators such as “proportion of population that feel safe walking alone around the area they live”.
4. **Indicator coming from external institution with blue color:** A few indicators (2) are a synthetic index developed by different international organizations that would be centrally computed for all countries.

Table 8 – Status of 23 indicators of Goal 16

No	Assessment of Indicators	#s of Indicators (%)
1	International level indicators	2
2	Ready to be assessed using traditional approach	2
3	Additional approach to calculate these indicators	9
4	Required non-traditional data approaches including Big data usage and ICT based data management- MISSING INDICATORS	10

Table 8 presents a breakdown of the 23 indicators by current status. There are 10 indicators that need more effort in terms of data collection and analysis. In addition, some indicators can be collected easily through usage of technologies. This does not require that much effort for the implementation of the data innovation. There are 2 green indicators that are easily available, the 11 orange indicators need more calculations and the 2 blue indicators are considered as global indicators. The remaining 10 red missing indicators need more effort in the collection of data or analysis between data sources of administrative data and open data sources. A detail of those red missing indicators shall be assessed further in this study.

6.2.2 Governance Indicators Requiring Non-Traditional Data

By reviewing the governance targets and indicators, it was found that the number of composition SDGs defined by UN exceed the nationally produced statistics which resulted to focus on the following 10 missing indicators in generating them by using non-traditional data methods for defining of national as well global indicators.

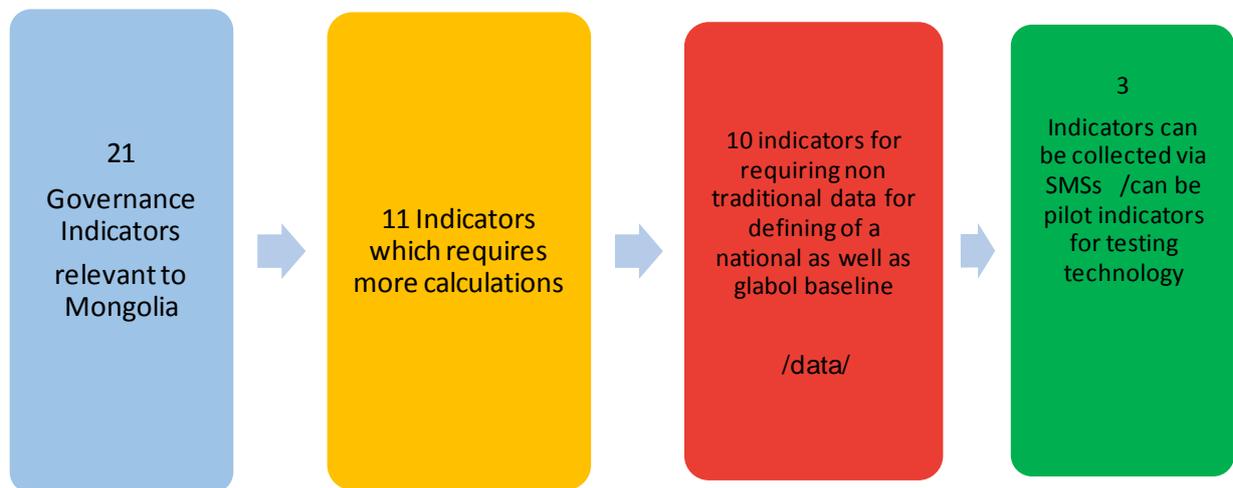


Table 9-Missing Indicators Requiring Non-Traditional Data

10 missing indicators for requiring non-traditional data
Indicators 16.1.3: Proportion of population <u>subjected</u> to physical, psychological or sexual violence in the previous 12 months
Indicators 16.1.4: Proportion of population that feel safe walking alone around the area they live

Indicators 16.2.1: Proportion of children aged 1-17 years who experienced any physical punishment and/or psychological aggression by caregivers in the past month
Indicators 16.2.2: Number of victims of human trafficking per 100,000 population, by sex, age and form of exploitation
Indicators 16.2.3: Proportion of young women and men aged 18- 29 years who experienced sexual violence by age 18.
Indicators 16.5.1: Proportion of persons who had at least one contact with a public official and who paid a bribe to a public official, or were asked for a bribe by those public officials, during the previous 12 months
Indicators 16.6.2: Proportion of the population satisfied with their last experience of public services
Indicators 16.7.2: Proportion of population who believe decision-making is inclusive and responsive, by sex, age, disability and population group
Indicator 16.b.1: Proportion of population reporting having personally felt discriminated against or harassed in the previous 12 months on the basis of a ground of discrimination prohibited under international human rights law

TARGET 16.1 SIGNIFICANTLY REDUCE ALL FORMS OF VIOLENCE AND RELATED DEATH RATES EVERYWHERE.

Name	16.1.3 Proportion of population subjected to physical, psychological or sexual violence in the previous 12 months
Frequency	Every year
Key owner	CURRENTLY NO ONE IS IN CHARGE OF THIS INDICATOR RELATED OVERALL DATA
Definition	Physical violence: This concept is equivalent to the concept of physical assault. This includes serious and minor bodily injuries and serious and minor physical force. According to the ICCS, these are defined as: Serious bodily injury, at minimum, includes gunshot or bullet wounds; knife or stab wounds; severed

	<p>limbs; broken bones or teeth knocked out; internal injuries; being knocked unconscious; and other severe or critical injuries.</p> <p><u>Serious physical force</u>, at minimum, includes being shot; stabbed or cut; hit by an object; hit by a thrown object; poisoning and other applications of force with the potential to cause serious bodily injury.</p> <p><u>Minor bodily injury</u>, at minimum, includes bruises, cuts, scratches, chipped teeth, swelling, black eye and other minor injuries.</p> <p>Minor physical force, at minimum, includes hitting, slapping, pushing, tripping, knocking down and other applications of force with the potential to cause minor bodily injury.</p> <p>Sexual violence: Unwanted sexual act, attempt to obtain a sexual act, or contact or communication with unwanted sexual attention without valid consent or with consent as a result of intimidation, force, fraud, coercion, threat, deception, use of drugs or alcohol, or abuse of power or of a position of vulnerability. This includes rape and other forms of sexual assault.</p> <p>Psychological violence: There is as yet no consensus at the international level of the precise definition of psychological violence and there is as yet no generally well established methodology to measure psychological violence.</p>
Disaggregation	Sex, age, income, and geographic location.
Calculation method	$Mx = \frac{\text{Victims of physical, psychological or sexual violence}}{\text{Total number survey respondents}} \times 100$
Status of Availability	No overall baseline
Root cause if not available	There was no such national indicator to be measured.
Preferred data	<ul style="list-style-type: none"> ▪ General Police office, the General Prosecutor office and the Court ▪ CSOs: Women’s Fund, Human Rights Center and National Center for Domestic Violence
Other potential data	<ul style="list-style-type: none"> ▪ Human Rights reports of UN and NCHR.
Action required	<ul style="list-style-type: none"> - Define and select types of physical, sexual and psychological violence to be asked by questionnaire. - Identify the right stakeholders to carry out this survey. Develop a methodology to conduct this survey - Collect data annually.

Name	16.1.4 Proportion of population that feel safe walking alone around the area they live
Frequency	Every year
Key owner	THE GENERAL OFFICE OF POLICY
Definition	This indicator refers to the proportion of the population (adults) who feel safe walking alone in their neighborhood.
Disaggregation	Sex, age and location.
Calculation method	The question: How safe do you feel walking alone in your area/neighborhood? Answer: Very safe/fairly safe/bit unsafe/very unsafe/ I never walk alone after dark/don’t know. The proportion of population that feel safe is calculated by summing up the number of respondents who feel “very safe” and “fairly safe” and dividing the total by the total number of respondents.

Status of availability	No baseline
Root cause if not available	There was no survey conducted.
Preferred data	<ul style="list-style-type: none"> ▪ Administrative data of the General Police Office
Other potential data	<ul style="list-style-type: none"> ▪ Social platform sources
Action required	<ol style="list-style-type: none"> 1. Data needs to be collected annually 2. If it collects via SMSs, the following measures need to be taken: <ol style="list-style-type: none"> 2.1 demographic information of mobile service providers needs to accurate to conduct a sample sizing in order to select target populations 2.2 Questionnaire need to be simplified to collect this data via SMSs 2.3 Incentives need to be defined in order to promote target populations to respond the survey. 2.4 Survey needs to be collected annually.

TARGET 16.2 END ABUSE, EXPLOITATIONS, TRAFFICKING AND ALL FORMS OF VIOLENCE AGAINST AND TORTURE OF CHILDREN.

Name	16.2.1 Proportion of Children aged 1-17 years who <u>experienced any physical punishment and /or psychological aggression by caregiver in the past month</u>
Frequency	Every year
Key owner	THE NATIONAL CENTER FOR CHILDREN
Definition	<u>Psychological aggression</u> refers to the action of shouting, yelling or screaming at a child, as well as calling a child offensive names, such as ‘dumb’ or ‘lazy’. Physical (or corporal) punishment is an action intended to cause physical pain or discomfort, but not injuries. <u>Physical punishment</u> is defined as shaking the child, hitting or slapping him/her on the hand/arm/leg, hitting him/her on the bottom or elsewhere on the body with a hard object, spanking or hitting him/her on the bottom with a bare hand, hitting or slapping him/her on the face, head or ears, and beating him/her over and over as hard as possible.
Disaggregation	Sex, age, income, geographic location.
Calculation method	Number of children aged 1-17 years who are reported to have experienced any physical punishment and/or psychological aggression by caregivers in the past month divided by the total number of children aged 1-17 in the population multiplied by 100.
Status of Availability	No baseline
Root cause if not available	No survey was conducted before.
Preferred data	<ul style="list-style-type: none"> - Save the Children - World Vision Mongolia - Child Protection Network - The National Center for Children – 108 hotline and joint team at khoroo, bag level including khoroo governor, policeman, social worker and family doctor) - Kindergarten, school’s teachers and social workers.
Other potential data	<ul style="list-style-type: none"> - UNICEF reports
Action required	<ul style="list-style-type: none"> - Methods on calculation by using traditional and non-traditional data to define national and global indicators. - Definition and methodology need to define clearly in order to conduct this survey. - There is a need to data sharing network to share data source of CSOs for consolidation data for defining national and global indicators. - A solid system needs to be defined to monitor and report this indicator a monthly basis.

Name	16.2.2 Number of victims of human trafficking per 100,000 population, by sex, age and form of exploitation (detected and undetected)
Frequency	Every year
Key owner	THE GENERAL POLICY OFFICE/LEGISLATIVE OFFICES
Definition	Exploitation shall include, at a minimum, the exploitation of the prostitution of others or other forms of sexual exploitation, forced labour or services, slavery or practices similar to slavery, servitude or the removal of organs” The number of victims is defined as the number of detected and estimated number of non-

	detected adult women and men and girls and boys (18-) who have been trafficked for different forms of trafficking in persons.
Disaggregation	Age, sex of victims, and form of exploitation, age and sex of perpetrator
Calculation method	The indicator will be calculated as the ratio between the sum of <u>detected and undetected victims of trafficking</u> and the population resident in the country, multiplied by 100,000.
Root cause of no available	No baseline.
Preferred data	<ul style="list-style-type: none"> - The General Police office, the General Prosecutors office and the Court - CSOs: Human Rights Center and Gender Equality Center
Other potential data	<ul style="list-style-type: none"> - The U.S. Department of State's trafficking in Persons Reports. - ILO Reports
Action required	<ul style="list-style-type: none"> - Improve legislative or procedural conditions to use data from non-traditional data sources. - Methods need to be developed on calculation of traditional and non-traditional data for the determination of national and global indicators. - Identify and collaborate with designed CSOs to share data with respective governmental authority to have a consolidated data for the determination of national and global indicators. - Conduct a survey annually.

Reference:www.unodc.org

Name	16.2.3 Proportion of young women and men aged 18-29 years who experienced sexual violence by age 18.
Frequency	Every year
Key owner	Currently no one collect this data, an ideal organization can be the NHRC
Definition	Sexual violence comprises any sexual activities imposed by an adult on a child against which the child is entitled to protection by criminal law. This includes: (a) The inducement or coercion of a child to engage in any unlawful or psychologically harmful sexual activity; (b) The use of children in commercial sexual exploitation; (c) The use of children in audio or visual images of child sexual abuse; and (d) Child prostitution, sexual slavery, sexual exploitation in travel and tourism, trafficking for purposes of sexual exploitation (within and between countries), sale of children for sexual purposes and forced marriage. Sexual activities are also considered as abuse when committed against a child by another child if the offender is significantly older than the victim or uses power, threat or other means of pressure.
Disaggregation	Sex, age, income, geographic location, marital status, & education.
Calculation method	Number of young women and men aged 18-29 years who report having experienced any sexual violence by age 18 divided by the total number of young women and men aged 18-29 years, respectively, in the population multiplied by 100.
Status of Availability	No baseline
Root cause if not available	No one carried out this survey.

Other preferred data	<ul style="list-style-type: none"> ▪ The general policy office’s data ▪ The National Center for Domestic Violence ▪ Gender Equality Center
Action required	<ul style="list-style-type: none"> - National questionnaire needs to be developed in order to measure this indicator. This is a considerable sensitive information for victims. - NRO needs to collaborate with professional organizations to collect this data. - Currently, this data is available but a very limit. Thus, this survey needs to be conducted a nation-wide annually.

Reference: <http://data.unicef.org/child-protection/sexual-violence.html>

TARGET 16.5 SUBSTANTIALLY REDUCE CORRUPTION AND BRIBERY IN ALL THEIR FORMS.

Name	16.5.1 Proportion of persons who had at least one contact with a public official and who paid a bribe to a public official, or were asked for a bribe by those public officials, during the previous 12 months
Frequency	Every year
Key owner	Independent Agency Against Corruption
Definition	For this indicator, public official refers to persons holding a legislative, executive, administrative or judicial office. In the operationalization of the indicator, a list of selected officials and civil servants is used
Disaggregation	Sex, age, education of bribe giver and public officials, type of official income level of bribe givers.
Calculation method	The indicator is calculated as the total number of persons who paid at least one bribe to a public official in the last 12 months, or were asked for a bribe in the same period, over the total number of persons who had at least one contact with a public official in the same period, multiplied by 100.
Status of available	No baseline
Root cause if not available	National survey was not conducted on this before.
Preferred data	- Annual special survey on corruption of the IAAC
Other potential data	<ul style="list-style-type: none"> - The Asia Foundation - Transparency International
Required action	<ul style="list-style-type: none"> ▪ Currently, this data is available but a very limit. Thus, this survey needs to be conducted a nation-wide annually.

TARGET 16.6 DEVELOP EFFECTIVE, ACCOUNTABLE AND TRANSPARENT INSTITUTIONS AT ALL LEVELS.

Name	16.6.2 Proportion of the population satisfied with their last experience of public services
Frequency	Every year
Key owner	POTENTIAL STAKEHOLDER CAN BE THE CABINET SECRETARY OF THE GOVERNMENT
Definition	In order to be effective and accountable, intuitions must be responsive to the needs of the population. This indicator will require the use of perception based population surveys and will collect relevant data on the lived experience of

	<p>individuals seeking access to and obtaining basic public services, such as health care, education, water and sanitation, as well as services provided by the police and judicial system.</p> <ul style="list-style-type: none"> ▪ access to basic services ▪ access to quality, essential health care services ▪ quality education, including facilities ▪ access to affordable, reliable energy services ▪ social inclusion ▪ adequate house ▪ rule of law ▪ effective, accountable and transparent institutions
Disaggregation	Data should be disaggregated by type of public service accessed (e.g. health, education, housing, social services, police, courts). Data should also be disaggregated by geographic location and the ethnicity, sex, age, income, disability status, and civil status.
Computation method	The indicator is calculated as the number of respondents replying that they were satisfied or very satisfied with their last experience of accessing a public service divided by the total number of respondents. The data may be weighted to reflect the general population.
Status of Available	No baseline
Root cause if not available	No consolidated data on this.
Preferred data	All Ministries, National and Local Governmental offices' web-based survey.
Other potential data	Social media – general public perspective
Action required	<ol style="list-style-type: none"> 1. Questionnaire needs to be developed in order to collect public perception on a particular sector or service and target groups. 2. Data needs to be collected annually 3. Data owner need to be identified first. 4. If this data collects via SMSs, the following measure need to be taken: <ol style="list-style-type: none"> 4.1 Demographic information of mobile service providers needs to accurate to conduct a sample sizing in order to select target populations. 4.2 Questionnaire need to be simplified to collect this data via SMSs 4.3 Incentives need to be defined in order to promote target populations to respond the survey. 5. Conduct this survey annually.

TARGET 16.7 ENSURE RESPONSIVE, INCLUSIVE, PARTICIPATORY AND REPRESENTATIVE DECISION-MAKING AT ALL LEVELS.

Name	16.7.2 Proportion of population who believe decision-making is inclusive and responsive, by sex, age, disability, and population group.
Frequency	Every year
Key owner	The Cabinet Secretary of the Government as potential body
Definition	For this indicator, one program can be selected and also specific population group such as youth between 18-35 years old can be targeted for this indicator in order to evaluate a certain government service.
Disaggregation	Sex, age, disability, populations group and education.

Calculation method	$M_x = \frac{\text{Total number survey respondents of target group}}{\text{Total targeted population group}} \times 100$
Status of Available	No baseline
Root cause if not available	Every governmental agencies collect public opinions on a certain public service. There is no national wide consolidated report on it.
Preferred data	
Other potential data	All ministries and some of government organizations have a web-based survey to promote civil participation for inputting their various policy and strategic documents.
Action required	<ol style="list-style-type: none"> 1. Questionnaire needs to be developed in order to collect public perception on a particular government service with a detailed disaggregation. 2. Data for particular public service needs to be collected when it needs. 3. Data owner need to be identified who monitor this indicator. 4. If this data collects via SMSs, the following measure need to be taken: <ol style="list-style-type: none"> 4.1 Demographic information of mobile service providers needs to accurate to conduct a sample sizing in order to select target populations. 4.2 Questionnaire need to be simplified to collect this data via SMSs 4.3 Incentives need to be defined in order to promote target populations to respond the survey. 5. If this data collects by using internet access. Then, all detailed aggregations need to be available in filling out by respondents.

Source www.pefa.org.

TARGET 16.B PROMOTE AND ENFORCE NON-DISCRIMINATORY LAWS AND POLICIES FOR SUSTAINABLE DEVELOPMENT.

Name	16.b.1 Proportion of population reporting having personally felt discriminated against or harassed in the previous 12 months on the basis of a ground of discrimination prohibited under international human rights law
Frequency	Annually. The primary data source is surveys conducted at the national level.
Key owner	The National Human Rights' Commission can be an ideal body.
Definition	This indicator is proposed to monitor the inclusion, equal opportunities, and rule of law. Without this information, the indicator doesn't therefore permit estimates of incidence of discrimination. Surveys may exclude the homeless or low income groups without access to telephone. Face to face surveys often exclude non-urban population or members of linguistic minorities. There is evidence to suggest that the most marginalized populations are less likely to respond to surveys, but this effect is reduced an ensuring their participation in the preparation of the survey.
Disaggregation	Data for this indicator should be disaggregated by ground of discrimination, relationship with the person or entity felt to have discriminated (employer/employee, public official or employee, private enterprise, teacher/student, etc.), and place where the discrimination occurred (work, street, home, school, etc.) Age, sex, region and population group, income, civil status, and disability.
Calculation method	The indicator is calculated as the percentage of persons reporting having personally felt discriminated against or harassed within the last 12 months on the basis of a ground of discrimination prohibited under international human rights law
Status of	No baseline

Availability	
Root cause if not available	The Perspective survey on personality felt discrimination is never conducted national wide
Preferred data	Shadow reports of joint NGOs
Other potential data	<ul style="list-style-type: none"> ▪ Women’s Fund NGO ▪ National Rights Report of UN ▪ Women’s Federation of Mongolia ▪ Human Rights Center
Action required	<ul style="list-style-type: none"> - A comprehensive questionnaire needs to be developed for special target groups such as public and private organizations including workplaces. - Conduct a survey annually. - Identify an accountable body for this indicator, ideally, can be CSOs, or NHRC.

Reference: <http://www.ilo.org/global/statistics-and-databases/lang--en/index>

6.2.3 Recommendations in Governance Sector				
NATIONAL CONSENSUS ON CONCEPTS AND PRINCIPLES				
1	Goal 16 Indicators need to be officially defined and approved by the Government of Mongolia. Based on an official translation, national consensus document needs to be developed	<ul style="list-style-type: none"> ▪ Translate SDGIs. ▪ Develop a consensus document by participation of related professional organizations and stakeholders 	<ul style="list-style-type: none"> - Declaration of Transform the World of UN - Conciliation of SDGIs - Ministry of Foreign Affairs - Multi-sectoral stakeholders including PPOs, CSOs and Academicians. 	Urgent and Important
2	Methodology on Data collection on Goal 16 needs to be developed and approved and it should be an accessible for all stakeholders.	<ul style="list-style-type: none"> - Review existing research and survey methodologies. - Conduct a comparative analysis with international methodologies - Develop or upgrade Mongolian relevant research and survey methodology in line with SDGIs. 	<ul style="list-style-type: none"> - NSO - Multi-sectoral stakeholders including PPOs, CSOs and Academicians - 	Urgent and Important. Measures to be taken within 1 and 2 year.
3	Data calculation needs to be in line with international standard, particularly, crime calculations.	<ul style="list-style-type: none"> - Follow international calculation standards, particularly 16.1.1 and 16.1.2. 	<ul style="list-style-type: none"> - NSO and other government authorities 	Urgent and Important.
4	Capacity building program on governance to key decision-makers as well as data stakeholders in order to provide an in-depth understanding of the importance of SDGs and its' measurements.	<ul style="list-style-type: none"> - Conduct training on Goal 16 as full including measurement of indicators, coordination and decision making processes. 	<ul style="list-style-type: none"> - NSO - Multi-sectoral stakeholders including PPOs, CSOs and Academicians 	Urgent and Important.
5	Identification of owners for absent governance indicators.	<ul style="list-style-type: none"> - Identify the most ideal body to be responsibility for absent SDGIs implementation. 	<ul style="list-style-type: none"> - The Government of Mongolia - Authorities established by the Parliament. 	Important and Urgent
6	Data need to be available to measure Goal 16	<ul style="list-style-type: none"> - Collect all missed data 	<ul style="list-style-type: none"> - NSO 	Important and Urgent
LEADERSHIP AND INSTITUTIONAL ENGAGEMENT				
1	Requirement of a roof or an umbrella organization to be in charge of the	<ul style="list-style-type: none"> ▪ Set up a governing body to manage SDGs' implementation. 	<ul style="list-style-type: none"> ▪ The Government of Mongolia. ▪ Authorities established by the 	Important

	implementation, and monitoring, and evaluation of SDGs.		Parliament.	
2	Establishment of unified data sharing and exchanging center or system where publically accessible data can be shared and exchanged by public and private organizations.	<ul style="list-style-type: none"> - Establish an unified data management center 	<ul style="list-style-type: none"> - NSO - The Information and Technology Department of the Government of Mongolia. - Data center of the State Enterprise and other relevant organizations. 	Important
3	Creation of a Data Revolution Network to take a lead of the implementation of data innovation on data management including from a whole chain of data value chain in conjunction with SDGs, particularly governance.	<ul style="list-style-type: none"> - Develop National Action Plan - Set up a data revolution network and system - Conduct a regular meetings with multi-sectoral stakeholders 	<ul style="list-style-type: none"> - The same as above. 	Important and implement step by step.
4	Measurement of some of governance indicators needs to be assigned to professional and specialized institutions.	<ul style="list-style-type: none"> - Identify potential SDGs to be measured by an independent. Specialized and professional bodies (CSOs, research institutions, private companies/partnership and freelance consultants. - Support strengthens of an independent third parties based on a fair competition. 	<ul style="list-style-type: none"> ▪ The same of as above 	Important
LEGAL FRAMEWORK				
1	Modification of Mongolian SDV2030 to be in line with global SDGs and Its indicators.	<ul style="list-style-type: none"> - Revise Mongolian SDV2030 according to global the Declaration of SDGs - Develop a draft resolution of the Parliament. 	<ul style="list-style-type: none"> - Ministry of Justice - NSO - Professional stakeholders 	Important
2	Creation mechanism on incentives to share data with the government.	<ul style="list-style-type: none"> ▪ Develop policy and operational document on incentives for private entities to share data with the 	The same as above	Important

		government orgs.		
NATIONAL STANDARD				
1	National standards for ICTs to enter, transport, store, sharing data need to be developed.	- ITC of the Government	- NSO - Multi-stakeholders - ITC of the Gov.	Important
ICT INFRASTRUCTURE				
1	Creation of consolidated system among government authorities.	- Create or link an effective ICT information sharing system among all governmental organizations based on current infrastructure.	- NSO - ITC of the Gov of Mongolia. - Governmental orgs - Others	Important
2	Support the improvement of CSOs' ICT infrastructure and required its' capacity.	- Run data management via ICT	- The Gov of Mongolia - NSO - International and donor organizations - CSOs and POs	Important
HUMAN RESOURCE CAPACITY				
1	Training on statistics, data management and ICT to data stakeholders.	▪ On-going training by participation of respective stakeholders.	- NSO and other professional organization	Important
2	Training on Governance and SDGs	- Training on Governance - Prepare ToTs on SDGs (Bag, khoroo governors, all level of teachers, and social workers) - Conduct series of trainings via social media, mass media and traditional training approach.	- NSO - CSOs, PPOs	Important
3	General public training on computer and digital literacy among general public.	- Conduct series of training via social media, mass media and traditional training approach.	- Ministry of Education, Culture and Science. - Donor and International organizations - CSOs, & PPOs	Important

7 FINDINGS, RECOMMENDATIONS AND QUICK WINS

This assessment could be one of initial attempts to grasp an overview of the Mongolian data eco system and the impact of “Big data” and pre-conditions for mobilizing “Data revolution” in Mongolia even though it had a particular narrowed context of SDG. Within the assessment of two months, we tried to engage relevant stakeholders as much as possible by carrying out desk reviews, 2 workshops to get discussions on focused areas including Healthcare and Governance sectors (to understand indicator level issues) and one technical workshop for Big Data and Data Revolution context (to understand the big picture of Mongolian data eco system) by engaging public and private sector representatives (Ministries, Banks, Telecoms, NGOs etc). In addition, we took interviews from the stakeholders who are assumed to have the most data and key roles. The assessment was executed in our proposed approach (top down i.e., big picture perspective and bottom up i.e., indicator level perspective) described in Methodology session in 1.2

7.1 FINDINGS

Here are the findings of our assessment which we divided into two perspectives, namely, an indicator level perspective and the big picture perspective:

From indicator level perspective:

1. For 157 missing indicators (that were named by the previous assessment as not readily available by the current statistical capacity, namely, traditional approach), this is obvious that to find answer for such indicator, the search is needed for a new source or new technique. However, our initial review shows that a significant portion have no need to look for such new sources/techniques. To give an example of such indicator is SDG indicator 1.5.3: Number of countries with national and local disaster risk reduction strategies. This is more or less “Yes/No” question which can be answered by assigning the indicator to a respective government agency.
2. Filtering out such “Yes/No” like indicators, 81 indicators were remained to be on our focus for further search of new sources/techniques and we used a method using the data value chain concept to find a root cause of missing. As a result, majority of the indicators are not available because of two main reasons:

- a. There is no data or the existing data is not sufficient to bring the full picture with assurance. The main root cause is that there is no entity hold accountable for that. There is no method how to collect the data.
 - b. The data is available here and there, but no one is hold accountable for integrating, processing and reporting.
3. While doing the assessment, it became clear that a single source of data is not sufficient to get full insights. At least pair of sources appears to improve the indicator measurement significantly with more disaggregation, quality and accuracy. This requires a great extent of collaboration, leadership, and openness among the data holders.

From big picture perspective:

1. It is clearly seen that data is hugely available both in public and private sectors. Particularly, the government of Mongolia has fast growing data from its rapidly digitizing e-government services. Today, there are already more than **40 government agencies who have a certain Information Management System (IMS) in place. Some exist already more than 10 years while majority is running for 3 to 5 years.**
2. However, these systems were developed separately by just primarily focusing on its own objectives that the respective government agency had at the time of development.
3. **The private sector is equally growing very fast in terms of data. The leading players are financial and telecommunication sectors.** Both sector has reached saturation in terms of user base. It is hard to find anyone with no bank account or mobile number (i.e., number of active mobile phone is more than Mongolian population).
4. **However, the private sector data is not easily available for statistical purpose.** It requires more leadership, clear understanding of each other's requirements (private sector and the government) and precise collaboration mechanism by accounting all potential risks (legal, technical, human and business rights etc).

7.2 RECOMMENDATIONS

Given the above findings, we conclude the following recommendations both in technical and legal wise.

Recommendation 1: Step by Step Standardization and Unifications

Given the current rapidly strengthening e-government services in Mongolia, **a sector wide standardization and consolidation appears to be the next step**. This means, for instance, the healthcare sector needs to have some sort of health care data exchange center that can serve for all healthcare stakeholders (the ministry, the relevant agencies, public and private hospitals, patients etc) for doing seamless data flow and data exchange in between. The same applies for the justice sector in which all key parties have now independent siloed systems (i.e., Police IMS, Prosecutor IMS, Court IMS, and Court Decision Enforcement IMS) that also needs standardization and consolidation. It will give benefit to everyone. For instance, it will enable an ordinary citizen to get better and faster service while enabling the government to create seamless cohesive processes thus providing much better collaboration inside and outside the government as well as to get more detailed data statistics with better quality faster and more cost effectively for making timely and right decision.

While the sector wide standardization and consolidation is taking place, it is **the next step to have a nationwide standardization and consolidation that will enable data exchange and data flow inter-sectors (between healthcare and justice) and between private and public sectors**. In fact, the NSO of Mongolia already started taking action in this direction by preparing to establish a unified data base which will become a base for government big data. In this effort, the core database appears to play an important role which includes civil and household registration, property registration, legal entity registration and address registration systems. The former three systems were updated just recently and the address registration system needs proper land registration which requires further development. We highly recommend this effort to continue in the new government agenda.

Recommendation 2: Nurturing Data-Driven Decision Making Culture

The ultimate goal of the SDG is to assist decision makers and public aware of situations for critical issues so that the decision makers accountable for them by being monitored publicly. This is all about nurturing data-driven decision making culture. Such nurturing can be achieved by assigning each indicator to a certain owner. Therefore, it is highly recommended to clearly assign the indicators to the ministries and make it publically aware periodically (annually) as a key performance index of the

ministries. Only then it can truly make the government accountable for the critical issues those powered by SDGs.

Recommendation 3: Engaging Private Sector in More Guided, Mutually Supportive Way

Compared to standardization and consolidation between government agencies, it will be more challenging to do between the government and private sector. However, such effort is needed since it is clear that far more benefit will be derived than the challenges. Particularly, the challenges can be considerably reduced when there is coordinated, well planned, win-win efforts from both sides. Within SDG monitoring context, the followings are some key identified items:

- In private sector, the most potential players are Banks and Telecom companies in terms of their data sourcing capacity as well as their huge infrastructure potential that can be leveraged.
- From telecom, there are two potential roles in SDG monitoring: First, telecoms companies possess a huge amount of rapidly growing data that can be used for certain statistical purposes, particularly, near to real-time statistics. Second, the telecom infrastructure can be leveraged for statistical purposes such as for making traditional survey in more cost effective and faster way.
- From banking, the same roles apply in SDG monitoring: Banks possess a huge amount of rapidly growing data (particularly related to consumption and saving) that can be used for certain statistical purposes, particularly, for poverty and justice related statistics. This sector requires more standardization and unification for better data exchange and data flow in between. For instance, it is now necessary to merge or unify (not necessary technically or physically, but rather it is crucial in terms of standardization) between siloed card processing provided by different banks.

Recommendation 4: A legal framework for New World Where Data Needs Collaboration

The relation with regard to determining and evaluating stable development goals, creating, utilizing and keeping the confidentiality of different types of research data of government, non-government and private sector, needs to be regulated under laws. There are defects such as the “Regulation on using the electronic database of government institutions” passed by the Government Resolution No.212 of 2013 entitled state owned enterprise to give permission, and it is not clear whether institutions established by the Parliament must follow this regulation. In addition to our reference to relevant laws in other parts of this report based on this partial analysis, we suggest the following:

4.1. Government’s Leadership by Defining a Legal Framework for SDG indicators

- To conduct further legal framework research on each SDG indicator, to continue developing concept paper for amendment of relevant laws and draft laws.

The big data collected as a result shall be possessed by the government. The Government and its Cabinet of Secretariat should participate in the development of the suggested amendments and revision of laws. In addition, the environment to collaborate with institutions established by the Parliament should be created.

- The UN determined the SDG by 15 years and established how to determine developments in the 15 years. Since the stable operations of government organizations and officials who are in knowledge of the task is significantly critical, all government institutions should note that the dismissal or change of qualified officials who are responsible for the task will result restarting from the beginning. Legal document establishing common position can be adopted as well.
- The newly established government is determining its action plan for the next 4 years, on these days. In this regard, we suggest the Cabinet Secretariat of the Government, the Ministry of Justice and other government institutions to include up-to-date steps to establish the legal basis of big data revolution, to effectively determine the state, organizational and individuals’ secrets in the course of data exchange and to ensure the confidentiality of information, in the Government’s action plan for the next 4 years

4.2. Undertake Amendments in Existing Laws and Initiat New Laws

- **The Statistics Law** needs to be updated, just to conclude from the analysis made on big data, including clear regulation of duties of government organizations and officials who have access to secret information;
- To amend three general laws (**Law on Individuals' Secrets, Law on Organizations' Secrets and Law on State Secrets**) related to secret information or develop one or several laws upon further research, which include the following information:
 - clearly define which kind of information is secret
 - introduce some procedural regulations such as keeping, processing, using, analyzing and using for decision making process the secret information
 - develop the legislation on security of electronic information consistent with international standards considering IT development
 - clearly define the sanctions for disclosure an usage of secret information in any ways.
- **Amendment to General Law on State Registration (2009):** there is a need to establish general regulation on management of state data, information exchange and keeping confidentiality of information.
 - The main institution to create information database, how other institutions shall use the information in the database and eliminate the difference of information of government institutions.
 - To create legal basis to enable accessing necessary information fast and utilizing for decision making process with the use of information technology
- **New law on keeping the safety of IT is required.**
 - The new law should cover issues such as, management of information, the purpose of access of information to be clear in advance, utilization for different purposes to be notified to the information provider, informed consent, the information provider to be able to access its own information, the possibility of complaint in case of illegal changes, access, download, print and transmission of electronic data, the status and functions of government institutions responsible for reviewing and managing information safety, to precisely specify the participants to create, save, exchange and utilize secret information.

- It is now needed to evaluate the current situation that government institutions not exchanging information with each other and not providing information to NGOs, private sector and individuals, and the private sector usually not exchanging information by claiming “organizational secret” and significant time and money is ineffectively being spent, to share the IT achievements with each other, and all participants to change their thinking and approach in order to access required indicators and information in short period.

4.3.Improvement of Privacy of Information

- To extend privacy commitments to everyone who collects, uses, or has access to personally identifiable information and data on research participants in Mongolia. Ministries responsible for data collection for a certain indicator should issue a resolution requiring researchers and other data users to disclose clearly how and why personal information is being collected, used, and secured, and should be subject to legally enforceable obligations to ensure that personally identifiable information is used appropriately and securely.
- To introduce genuine privacy-enhancing techniques which minimize or eliminate the collection of personally identifiable data. Standardized self-evaluations and security audits and certification programs to help institutions achieve the goal of safeguarding the security of personal data.
- All participants of the community that are involved in the collection, use, and disclosure of personally identifiable data should take strong measures to safeguard the security of data.
- To clearly specify the sanctions for disclosing secret information.

4.4.Legislation of Security of Electronic Information

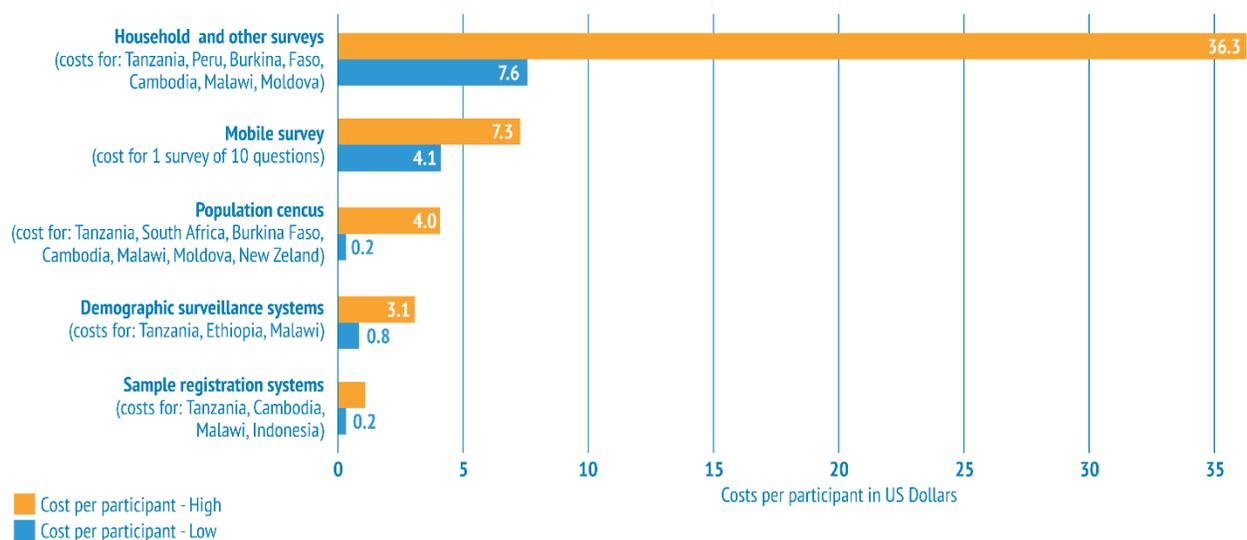
- To make the legislation on security of electronic information consistent with international standards considering IT development.

7.3 QUICK WINS

There are decent number of quick wins potentially having a significant impact on improving the current capacity of NSO Mongolia within a shorter time frame as below:

- Create a web based National dashboard system that will make each ministries and agencies to hold accountable for certain SDG indicators in front of public.
- Continue efforts for implementing Government Centralized Data Base which will enable more data sources to combine for improving quality and detail of the information

Figure 14 – Cost per survey



- Encourage use of more modern advanced data management technologies, particularly, self-service tools such as Tableau, Alteryx which are easy to be adopted and fast to get value
- Start engaging telecom and IT companies to collaborate on developing Smart survey platform such as SMS or App or Social platform (Twitter, Facebook etc) based survey platform ,Develop technology based Smart Survey methodologies: We assume traditional survey should be still used because there are still people who has limited access to technology and infrastructure such as disabled people, old people who cannot use new technology, smart phone etc while the new technology based survey should be applied for mass population.
- Encourage government agencies to have Chief Data Officer who is responsible for managing data architecture of the sector

- Make an assessment for each indicator using a similar template and the data value chain applied in this report for the two case studies.
- Encourage developing open and data sharing platform using Hadoop technology between Government agencies i.e., Ulaanbaatar City’s IT department has such platform. However, it is not fully utilized and not fully understood by the relevant stakeholders and decision makers.
- Create incentive mechanism of public engagement for survey as well as private sector for giving its data or leveraging its infrastructure for potential cost effective survey
- Use the card processing center where one can find all consumption and income related information or start collaborating with “VAT reimbursement system” project team to start using their data which can provide very detailed information of consumption related statistics.
- Join and make use of international initiatives like Global Forest Watch, GapMinder etc and work closely with similar project worldwide and initiatives such as joining World bank’s hidden database

The Dutch census of 2011 was carried out almost entirely by collecting data from registers, such as the new housing registry, in combination with other sources such as the land registry and the central bank. There were no household visitors to administer questionnaires. The census was conducted with a staff of 15 and a budget of €1.4m. By way of comparison, Germany – where register counts are combined with traditional census questionnaires – recruited 80,000 interviewers, and spent €750m on its census. China’s last census involved 6 million enumerators. Even with far lower wage costs, it cost €75m.

Source: Statistics Netherlands (2012) and (2014); UN Statistics Division (2013).

- Experiment with linking survey and administrative data: Experiments with linking survey and administrative data, primarily in Europe, have shown considerable potential to enrich our knowledge of households and individuals – at relatively low cost. Data may be linked between individuals and households from disparate sources, or between households and communities. For instance, in the 2009 Human Development Report for Mercosur (UNDP, 2009), a multi-dimensional poverty index for young people was constructed which included one dimension – health and environmental hazards – composed of indicators coming from administrative data at the state level in Brazil and at the provincial level in Argentina. These efforts are not free from challenges but the potential that linking offers to capitalize on the strengths of both household surveys and

administrative registries warrants further investigation and experimentation.

ANNEXES

ANNEX I: SOME LAWS ON CREATING DATABASE AND STATISTICS

Name of the Law	Related organizations or person	Key provisions related to data and information	Comments
Law on Copyright and Related Rights (2006)	State Registration and Intellectual Property Office ⁴ -SRIPO	<ul style="list-style-type: none"> to register works of copyrights and related rights at the requests of authors and copyright holders, to issue certificates and to establish a database of registered works; to provide references for resolution of disputes related to copyrights (26.1.7) 	-
Law on Central Bank (Mongol bank) of Mongolia (1996)	Bank of Mongolia	<ul style="list-style-type: none"> to publicize information on changes in the implementation and instruments of monetary policy, and on the state of monetary developments and the financial markets every quarter (34.1) to issue a monthly 	-

⁴ Two separate agencies have been united recently

		<p>bulletin on monetary statistics (34.2)</p> <ul style="list-style-type: none"> to submit information on monetary statistics and its annual report to the Government. (31.5) 	
Law on Electronic signature (2011)	Information Technology Office (State administrative body in charge of communications)	The functions of State administrative body in charge of communications don't include any functions related to statistics.	Although the law has been passed 5 years ago, it is only being implemented from last few months (in the public social insurance sector). The reason might be that there is no law regulating the general procedure on protecting secret information in Mongolia (Law on Information Technology etc.).
General Law on State Registration (2009)	State Registration and Intellectual Property Office-SRIPO	The law regulates the registration of properties, citizens, legal entities, information database and intellectual properties	<ul style="list-style-type: none"> There is a need to establish general regulation on management of state data, information exchange and keeping confidentiality of information. Needs to stipulate what is the main institution responsible for creating database and how other institutions shall use the information in the database, and eliminate the difference

			<p>of information of government institutions.</p> <ul style="list-style-type: none"> To create legal basis to enable accessing necessary information fast and utilizing for decision making process with the use of information technology
Law on State Registration of Property Ownership Right and Related Rights (2003)	State administrative body in charge of state registration-SRIPO	<ul style="list-style-type: none"> to create archive of original evidences of state registration and electronic database, sort and ensure the reliability of their maintenance and protection (8.1.3) 	-
Law on Collateral of Movable and Intangible Properties (2015)	State administrative body in charge of state registration-SRIPO	<ul style="list-style-type: none"> the state registration authority shall have an electronic database to register the collateral notices of movable and intangible properties (35.1) 	The law shall come into effect from September 1, 2016 and the registration of collateral shall be conducted electronically thereon. The Ministry of Justice is working on the draft of regulation necessary to implement the Law
Law on State Registration of Legal Entities (2015)	State administrative body in charge of state registration-SRIPO	<ul style="list-style-type: none"> to register legal entity's information and to publish according to Law (8.1.1); to maintain state registration list according to Law 	The function of State Registration Office to create statistics and to provide the statistics data to relevant organizations has not been included in the Law

		<p>(8.1.2);</p> <ul style="list-style-type: none"> • to provide references from state registration list according to Law (8.1.4); • to keep the record of names of legal entities registered, to create name database and to provide references from the database (8.1.5); 	
<p>Law on Combating Money Laundering and Terrorism Financing (2013)</p>	<p>Bank of Mongolia</p>	<ul style="list-style-type: none"> • the Financial Information Division (FID) of Bank of Mongolia shall receive, collect and analyze information (18.1.1); • to transfer such information that it may find suspicious to the authorized institutions and to create database of transferred financial transactions (18.1.2); • FID shall have an integrated information database (20.1) • FID shall cooperate with foreign and international 	<p>To research if it is possible to add provision on using for statistics purpose, without name of individuals and legal entities</p>

		institutions with similar functions (21.1).	
Law on Standardization and Conformity Assessment (2003)	General Authority of Standardization (Mongolian Agency for Standardization and Metrology)	<ul style="list-style-type: none"> • Mongolian Agency for Standardization and Metrology shall have an Information and enquiry unit (11.1). • The information and enquiry unit shall have a national information database to keep the original or copies of relevant international treaties, international, regional, foreign and national standards, technical regulations, guidance, recommendations, conformity assessment regulations and other normative-technical documents (11.2) • The information and enquiry unit shall provide a service to create, receive, register, save, protect, notify, print and sell the documents referred to in Article 	

		<p>11.2 of this law.</p> <ul style="list-style-type: none"> General Authority of Standardization shall verify products, grant and register conformity marks. (16.12) 	
Law on Cadastral map and Land Cadaster (1999)	Cadastral Agency under Ministry of Construction and Urban Development	<ul style="list-style-type: none"> Cadastral Agency is responsible for: regulation, research, statistics of the land cadaster, registration, economic, quality evaluation of the land 	Information on land is separated to 3 organizations; (a) land ownership right – State registration office under Ministry of Justice; (b) land map- Cadastral Agency under Ministry of Construction and Urban Development; (c) land use and land possession right- municipal governments. Needs further research to consolidate the Land data etc.
Law on Land (2002)	Municipal governors	Regulates relationships concerning land use and land possession right of individuals and legal entities	

ANNEX II: ANALYSIS ON EACH MISSING GOVERNANCE INDICATORS

✓- means there is no need to amend any law

No.	Indicator	Key organization	Participating organizations	✓	Comments/Recommendations
1.	16.1.2.Conflict-related deaths per 100,000 population, by sex, age and cause	National Police Authority (“NPA”), National Statistics Committee (“NSC”)	Judicial Council, General (“JGC”), National Prosecutor’s Office (“NPO”), “Unified system of legal information” project at the Ministry of Justice	✓	Common understanding is required; Whether or not to count serious injuries; This indicator can be determined by the registration of police.
2.	16.2.1 Proportion of children aged 1-17 years who experienced any physical punishment and/or psychological aggression by caregivers in the past month	Government authority in charge of children and family matters or the Ministry of labor and social welfare	Police, social officers, educational institutions and officials, Public organization and officials	✓	<ul style="list-style-type: none"> • There is no source of information to determine this indicator and no integrated system for registration • The new Law on children’s protection that was adopted on February 5, 2016 established the legal basis to determine and evaluate this indicator. • Needs to initiate Hot line in the short term, to determine this indicator based on the instances registered to the hot line and take measures to collect as complete information as possible in the medium term
3.	16.2.3 Proportion of young women and	NPA, National Human Rights Commission (“NHRC”)?	Ministry of Justice, NGOs, cellular providers, NHRC	✓	<ul style="list-style-type: none"> • No official source of information • This indicator can be determined by some nonconventional methods

	men aged 18- 29 years who experienced sexual violence by age 18				such as information of police, regular survey among the people or information of hospital and educational institutions
5.	16.3.1 Proportion of victims of violence in the previous 12 months who reported their victimization to competent authorities or other officially recognized conflict resolution mechanisms	NPA, NSC?	Ministry of Justice, NGOs, cellular providers, NHRC	✓	<ul style="list-style-type: none"> • The information and evaluation of this indicator can be determined by the information of Hot line in case information of adults can be registered to it, along with the information of courts • Additionally, the evaluation can be made by comparison of the above information to annual survey and/or surveillance
6.	16.3.2 Unsentenced detainees as a proportion of overall prison population	NPA, JGC	Investigation office, Independent Authority Against Corruption (“IAAC”), data of General Intelligence Agency (“GIA”) can be gathered from NPO	✓	This indicator can be determined and evaluated based on the data of these organizations

7.	16.4.1 Total value of inward and outward illicit financial flows (in current United States dollars)	Mongolbank (Financial Information Division (“FID”)), NPO, JGC	Commercial banks, police, Investigation office, IAAC, GIA, Customs Office	✓	<ul style="list-style-type: none"> • FID possesses the information on amount of financial flows transmitted through first level banking system. However, such information can not be accessed for the following reasons: (a) it is confidential as it is considered “suspicious”; (b) it is not established by the relevant authorities that it is illicit financial flows; and (c) not allowed under Law on Banking. • to develop legislation to use such information by only processing the numbers and keeping the names of individuals and organizations as confidential as referred to in the report.
8.	16.4.2 Proportion of seized small arms and light weapons that are recorded and traced, in accordance with international standards and legal	Police		✓	<ul style="list-style-type: none"> • to use the term “weapons that can cause injury, such as gun, firearm, knife chopper” instead of “seized small arms” and “light weapons”.

	instruments				
9.	16.5.1 Proportion of persons who had at least one contact with a public official and who paid a bribe to a public official, or were asked for a bribe by those public officials, during the previous 12 months	IAAC, NSC?	NGOs, research and consulting institutions, cellular providers, integrated web page	✓	Research- annual survey and independent evaluation of IAAC, household livelihood survey can be utilized, subject to further discussion
10.	16.5.2 Proportion of businesses that had at least one contact with a public official and that paid a bribe to a public official, or were asked	IAAC, NSC?	NGOs, research and consulting institutions, cellular providers, integrated web page	✓	Research- annual survey and independent evaluation of IAAC, household livelihood survey can be utilized, subject to further discussion

	for a bribe by those public officials during the previous 12 months				
11.	16.6.2 Proportion of the population satisfied with their last experience of public services	IAAC, Civil Service Council (“CSC”)?	NGOs, research and consulting institutions, cellular providers, integrated web page	✓	<ul style="list-style-type: none"> • Research- annual survey and independent evaluation of IAAC, household livelihood survey can be utilized, subject to further discussion • The research should be conducted by researchers or research institutions who are as independent as possible
12.	16.7.2 Proportion of population who believe decision-making is inclusive and responsive, by sex, age, disability and population group	IAAC	Parliament and Cabinet Secretariat of Government, National Human Rights Commission, other Ministries and NGOs	✓	<ul style="list-style-type: none"> • annual survey and independent evaluation of IAAC, household livelihood survey can be utilized, subject to further discussion; • It is advised that the IAAC would lead and consult with relevant government institutions, regarding how to define SDG 16.5.1, 16.5.2, 16.6.2 and 16.7.2 indicators in its annual evaluation and on how to determine as complete information as possible, and to improve the current method as needed; • To take a survey of customers of government

					<p>institutions and make comparison;</p> <ul style="list-style-type: none"> • To research how to integrate with the annual independent evaluation of corruption preventive activities, of which the result is announced on December 9, in terms of management and methods and how to utilize data collected from previous surveys to the following surveys, and to establish methodology that has no duplication and gaps; • To include information on how to determine SDG' indicators in the Terms of Reference when having researches and surveys conducted, to consult annually regarding how to improve it and take necessary steps; • Due to the reason that the IAAC's evaluation lacks in covering the whole population, to further research the recommendation to include the indicators in the "Social and economic outlook of household livelihood" survey quarterly conducted by NSO.
13.	16.7.1 Proportions	Public Service Counsel	CSO	✓	We consider that the information relevant to this

	of positions (by sex, age, persons with disabilities and population groups) in public institutions (national and local legislatures, public service, and judiciary) compared to national distributions				indicator can be provided by Public Service Counsel or CSC and that the legal basis has been established.
14.	16.b.1 Proportion of population reporting having personally felt discriminated against or harassed in the previous 12 months on the basis of a ground of discrimination	NHRC	The Prime Minister of Mongolia, National Gender's Commission, Government institution or agency in charge of issues of disabled people	✓	<ul style="list-style-type: none"> • We concluded that there is no need for new legislation or amendment to laws, in order to determine and evaluate this indicator; • To further research if it is necessary for NHRC to improve its forms and surveys.

	prohibited under international human rights law				
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ANNEX III: KEY ELEMENTS FOR A FUNCTIONAL DATA ECOSYSTEM IN HEALTH SECTOR

By assessing the key elements for a functional data ecosystem in the health sector, we use a methodology used in previous sections that identifies: (i) Leadership and institutional engagement, (ii) legal framework, (iii) national standard, (iv) ICT infrastructure & Big Data Technologies, and (v) Human resource and capacity as critical components of an enabling environment for open data.

The Data Ecosystem Mapping in the health sector will show the relationship between people, primary data and infrastructure whereby relevant institutions share data across the entire data value chain-spanning data acquisition, transmission, integration, dissemination, processing and use of data in the health sector. The concept of Data Value Chain is Central to understanding what will be needed to produce and use valuable data to support the SDG agenda in the health sector.

National Consensus on Concepts and Principles

The Mongolian Government asked for support from international organizations by calculation of SDG indicators in the health sector which are currently not measurable with traditional data sources. In order to measure those indicators, the following support is required from regulating bodies. Some regulations shall be introduced by the Ministry of Health in order to collect data from available sources before turning to Big Data and other non-traditional sources and approach. Meetings with key informants and review of existing data in the health sector made it clear that there are tremendous amount of data in “shelves” and in computers of soum level and Khoroo and district level hospitals, as well as private health institutions. Government policies and resolutions are needed to collect these data from private and other sources and make use of this data. In this case, we will already have the part of missing eight indicators covered with traditional data used in a non-traditional way.

Policy regulations needed from the Ministry of Health and government bodies include:

- Come to consensus and define definitions and methods of calculation for missing indicators.
- Analyze and review existing studies and research conducted on a regular basis and financed by international organizations, and make resolutions to count the major findings of these studies to official statistics
- Analyze and review existing studies and research conducted on a regular basis by NGOs, academia and private health care providers, and agree on whether those study results should be included into official statistics
- To find financial sources for conducting surveys on a regular basis (every 2-3 years) for calculating basic indicators, the assessment of which is currently fully absent in Mongolia
- To review and improve health data collection forms issued by the Ministry of Health and distributed to private and state-owned hospitals at soum, aimag, khoroo and district levels. Add questions for calculation of missing indicators for which data can be collected from primary health care providers
- To develop a database, which registers main findings of research and surveys conducted by international organizations, NGOs, communities, private sector and other sources
- To create a platform (database of databases) which unifies all databases in the health sector and makes the information and data exchange possible between these databases and their owners (major institutions in the health sector such as the Ministry of Health and its agencies, Social Security Authority, Hospitals (both private and public), other health centres).

Statistic reports are collected from soum, aimag, khoroo and district level public and private hospitals through the Health-Info database (developed with the support of ADB). Also, surveillance units at hospitals and statistical units of specialized hospitals, as well as other health care institutions and government agencies provide additional statistics to the sector information. All information is summed up at the Ministry of Health and Sports. But, as data is derived from different databases and sometimes just excel-sheets and unified at the ministry level, it is required that a unified database is created which makes the transfer of data from one database to another easy and comprehensive. For example: NCCD provides independent databases such as tuberculosis, HIV / AIDS statistics, and influenza surveillance unit provides own statistics, each in own format and written in own software “language” .

Leadership Policy and Institutional Engagement

Strong leadership from the Government, represented by the Ministry of Health, is vital to making the data revolution in the health sector. Such leadership should be made very concrete through various actions and activities, continuous engagement and “beyond the box” thinking of all relevant partners-government institutions like NSO, Health Development Centre, Public Health Institute, state-owned hospitals etc. Continuous involvement of the private sector, NGOs, media, international organizations and academia is also important.



Main goals of such leadership from government should be:

- (i) *Improve already existing institutional setups, procedures and systems, improving the data value chain through increasing the types of data acquired from primary sources (district and soum level hospitals, health sector research data, etc).*

For example, there is a huge archive of data at soum and district level, which is not delivered to the official statistics, i.e. to the Ministry of Health or NSRO, just because the forms delivered to district and soum level hospitals do not have questions covering the huge amount of potential information which could be delivered to the official statistics. An interview with the local, soum-level statistician revealed that in her own database in excel and paper form there is a lot of data which could be helpful to measure some of the missing indicators in the health sector (harmful use of alcohol, coverage of essential health services, mortality rate attributed to unsafe water, etc). The problem is that this data is not delivered to the Ministry of Health because the forms, which she should fill out, do not change and do not include new questions. These are the same forms which were sent from the Ministry years ago, even formatting has not changed, and there is no attempt from the government side to include new types of data. Therefore, the Ministry of Health should show the

leadership in a policy level to improve data collection from primary sources and lead the process to change the existing ways of data collection through new, innovative technologies as well as broader questions covering new areas.

- (ii) *Motivate private sector in sharing their data with government institution through tax incentives, information exchange, involvement in different donor-sponsored or government-sponsored health sector programs and initiatives.*

For example, more and more private hospitals (some with foreign investment) launched their operations in Mongolia. They use modern health software, which allows them to accumulate a lot of health data that could be used for government decision making. Through the right approach and right type of cooperation with the private sector, the government can obtain necessary data from the private sector by putting in place regulatory frameworks that ensure robust data privacy and data protection, and promote the release of data as open data by all data producers and build capacity for continuous data innovation.

- (iii) *Sufficient use of research and reports done by international organizations*

International organizations spend a lot of funds each year for research and different surveys conducted annually. Some of health sector missing indicators are already covered by some studies of international organizations, but unfortunately, sometimes these reports do not enjoy the necessary attention from the government as they deserve.

- (iv) *Invest in data, thus providing resources to institutions where statistical or technical capacity is weak; develop infrastructures and implement standards to continuously improve and maintain data quality and usability; keep data open and usable by all.*

ICT Infrastructure and Big Data Technologies

As mentioned earlier in Section 6.1.1, data on many SDG indicators (8) related to health issues is particularly sparse. There is almost no useful data on substance use disorders, harmful use of alcohol, mortality rate attributed to air pollution or mortality rate attributed to unsafe water, unsafe sanitation or lack of hygiene (these are examples of missing indicators in health sector). Therefore, it is quite clear that collection and monitoring of the missing SDG indicators in the health sector will require substantial additional investment into software and big-data processing programs, in order

to consolidate data collected through the efforts made by the Government and international organizations in existing databases like Health Info, and to develop reliable, high-quality data on a range of new subjects mentioned here.

There are several databases in the health sector initiated and funded by international organizations. The largest one is Health-Info database, created within the framework of the ADB-funded “Health Sector Support” project

Table 10-Health Sector Databases in Mongolia

Nº	Software Name	Type of Program	Place of Use
1	Health-Info3.0	Statistics and information program	Nationally
2	E-Hospital	Hospital information system	First Central Hospital of Mongolia, National Cancer Center, National Dermatology Center, Tuv Aimag, Khuvsgul Aimag, Khovd Aimag
3	E-Health	Hospital information system	Secondary hospitals
4	I-Medic	Hospital information system	Secondary hospitals
5	Monthly Report	Monthly statistical report	Nationally
6	Med soft	Hospital information system	Districts , First Maternity Hospital
7	Doctor Order	Hospital information system	Not operating
8	Mn Cardio	Telemedicine program	Secondary hospitals
9	Campus Medicus	Mother, infant surveillance system	Secondary hospitals
10	Tubis.mn	Tuberculosis surveillance system	Secondary hospitals
11	Flu.mn	Influenza registration and inspection program	Secondary hospitals
12	Ewar	Contagious disease registration and inspection program	Secondary hospitals
13	RED2.0	Immunisation registration and inspection program	Not operating
14	Smart Cancer	Cancer morbidity and mortality registration and inspection program	Secondary hospitals
15	www.Screening.mn	Cancer screening program	Secondary hospitals
16	LMIS	Laboratory information system	Secondary hospitals
17	BCDinance	Blood Transfusion registration and inspection program	Secondary hospitals
18	LICEMED	Drug registration information program	Secondary hospitals

We recommend that government should aim at establishing a “unified database of all databases in the health sector”, bringing together a range of databases already existent in this sector, and making the data exchange and data analysis across health institutions and other stakeholders possible.

National Standard

In Mongolia, international organizations (UNDP, UNFPA, WHO, ADB, World Bank, GIZ, etc) work with government institutions to set and enforce common standards for data collection, production, anonymization, sharing and use in the health sector to ensure that new data flows are safely and ethically transformed into usable data. They also support the Mongolian public sector in its capacity-building efforts.

As we see, there is quite a number of attempts and databases created, which all attempt to collect, systemize and use data in the health sector in an appropriate and useful way. But the problem is that most of these databases do not “talk” to each other: most of them are separate databases written in “different” languages and the consolidation of them is very difficult and time-consuming. Also, the quality of data collected and their entry is not sufficient. To be useful, data must be of high quality, at a level of disaggregation that is appropriate to the issue at hand, and must be made accessible to those who want or need to use them.

Comparability and standardization of data in those databases are crucial, as they allow data from different sources\databases or time periods to be combined, and the more data can be combined, the more useful they are. Combining data will allow for changes of scale – e.g., aggregating data from different databases will allow different analyses, comparison over time, if data on the same thing collected at different moments can be brought together to reveal trends. But too much data is still produced in the health sector using different standards.

Again, there is so much data buried in PDF documents of different projects of international organizations, where millions of dollars are paid for conducting these surveys and producing reports. There is a need for a profound analysis of the existing literature and research from the side of NSO to identify which health indicator related data can be obtained from those reports and which data NSO doesn’t need to collect on its own but just agree with those organizations to conduct these surveys on a regular basis and get their results to include into official statistics.

As noticed during our field trip to soum level hospitals or meeting with representatives of private hospitals, there is also a huge amount of administrative data at the soum and aimag level at their shelves that are not transferred to statistical offices; data generated by the private sector or by

academic researchers that are never released because the Ministry of Health or the NSO doesn't ask for their release (if they are not asked, who will do additional work of disclosing data and processing it!) Data that cannot be translated into action because of lack of operational effectiveness from the side of government bodies.

The Health Development Centre-the Agency with a mandate to collect public information does not always put efforts to collect as much data as possible, and does not update its questionnaires for data collection. The development of ICT sector and health related databases is so advanced that the Agency doesn't cope with the current pace of data flow increase and doesn't use the existing potential of available data which can be used for monitoring and calculating SDG health indicators.

Therefore, we consider that one of the key roles of UNDP, NSRO and MoH would be setting principles and common standards in the health sector to guide collective action to "improve" the collection and use of already existing data in "shelves" at soum and district level, as well as from the private sector, and also to create new ways of "consolidating" and unifying different databases which have already been created at different health sector institutions and hospitals and just need to be unified.

In order to determine 8 missing indicators in the health sector within the framework of the Sustainable Development Program of Mongolia, it is necessary to plan and reflect the financing for required surveys in the state budget, or request this financing from international donor organizations. If it will be decided that surveys and data from other surveys and research (conducted by NGOs, academia or international organizations) will be taken as official statistics, government resolution from the Ministry of Health is required which requests NSRO to consider those data as official statistics from the health sector.

Human Resources and Institutional Capacity

During our key informant interviews, we have noticed insufficient personnel in the field of health data processing and statistics, especially in rural areas: deficient human resources in most of rural and district hospitals. The key informants revealed that, although, **human resources exist, they are not skilled enough** or they are insufficient to cope with the increasing tasks (lack of specialized personnel for data processing and analyzing, for the process of populating problems with statistical data).

The following factors are, mainly, the ones causing this problem: insufficient training on new software and IT-programs, insufficient educational level of statisticians/data workers especially in the

countryside, personnel turnover; poorly prepared/ and the low incentive for the personnel (usually IT professionals or statisticians who work in sectors other than the health sector earn higher salaries. Therefore, the ones who work in the health sector as IT-personnel or statistician are not the best ones)

There are the following advantages and disadvantages related to human resources in the health sector with regard to the integration and consolidation of the official health statistical data and its distribution.

Advantages	Disadvantages
<ol style="list-style-type: none"> 1. It is common that most hospitals, medical centers and national centers have assigned persons as statistician and in some larger health centres-statistical departments 2. There are surveillance units in hospitals such as National Center for Maternal and Children’s Health, National Research center for Infectious Diseases and National Traumatology and Orthopaedic Research Center 3. Human resources are well trained within the framework of the E-health program introduced by the ADB. Most of statisticians can work with H-Info program and deliver data on time. 4. There are researchers who undertake surveys periodically and frequently and with a great level of quality 	<ol style="list-style-type: none"> 1. Lack of knowledge for using other programs besides H-info program 2. Insufficient number of statisticians or data entry clerks at health institutions 3. Most doctors still write their daily patient consultation reports per hand on paper so that there is a paper overload by data entry clerks which leads to human failures which leads to wrong statistics entry 4. Researchers who undertake routine and frequent surveys do not have access to data themselves after they have completed their surveys. Only lead researcher has the right to use the database 5. Researchers do not have access to H-info program data 6. There is no or little understanding of Big data in the health sector 7. Research and data collected by international organizations, NGOs, private sector and academia is not used to its full potential on an official basis

For example: In order to compute number of deaths caused by outdoor and indoor air pollution, there is insufficient staff who will collect daily weather news from each researching point and insert data to the program to connect it to diseases and to do analysis.

But, in the Law on Health approved in 2016, there are provisions which aim to create a health surveillance system and to observe population disease and deaths, and it is very important to create legal framework for this undertaking.

ANNEX IV: LEGAL REGULATION OF DATA IN HEALTH SECTOR: BEST PRACTICES

Human rights cut across many issues related to the data revolution in health sector. These rights include but are not limited to the right to an identity, the right to privacy and to ownership of personal data, the right to due process (for example when data is used as evidence in proceedings, or in research), the right to know how the data about own health condition is going to be used, whether own identity and my health information is protected and principles of consent. Any legal or regulatory mechanisms, or networks or partnerships, set up to mobilize the data revolution in health sector should have the protection of human rights and privacy of personal health data as a core part of their activities, specify who is responsible for upholding those rights, and should support the protection, respect and fulfillment of data privacy.

When the data is not confidential, it should be available and useable as open data, but without disclosing the identity of data owner. There must be respect for privacy and personal ownership of personal health data, and mechanisms in place so that people themselves have access to the information and are able to make choices accordingly. Crucially, people must have means for redress if they feel that they are being harmed or their rights infringed by the use of their data.

The confidentiality of patient records is central to the ethical tradition of medicine and health care. This tradition of confidentiality is in line with the requirements of the [Data Protection Acts 1988 & 2003](#), under which personal data must be obtained for a specified purpose, and must not be disclosed to any third party except in a manner compatible with that purpose. Given the immense sensitivity of health-related information, it is imperative that professionals in this sector be clear about their use of personal data⁵.

1. Concept

Protecting the security of data is important because health research requires the collection, storage, and use of large amounts of personally identifiable health information, much of which may be sensitive and potentially embarrassing. If security is breached, the individuals whose health information was inappropriately accessed face a number of potential harms. The disclosure of personal information may cause intrinsic harm simply because that private information is known by others. Another potential danger is economic harm. Individuals could lose their job, health insurance,

⁵ Data Protection Commissioner, <https://www.dataprotection.ie/docs/The-Medical-and-Health-Sector/245.htm>

or housing if the wrong type of information becomes public knowledge. Individuals could also experience social or psychological harm. For example, the disclosure that an individual is infected with HIV or another type of sexually transmitted infection can cause social isolation and/or other psychologically harmful results. Finally, security breaches could put individuals in danger of identity theft.

Protecting the privacy of participants and maintaining the confidentiality of their data have always been paramount in research and a fundamental tenet of clinical research. However, several highly publicized examples of stolen or misplaced computers containing health data have heightened the public's concerns about the security of health data. The extent to which these breaches have caused tangible harm to the individuals involved is difficult to quantify.

Moreover, data security is important to protect because it is a key component of comprehensive privacy practices.

The goals of security are threefold: to ensure that (1) only authorized individuals see stored data; (2) they only see the data when they need to use it for an authorized purpose; and (3) what they see is accurate. Traditionally, these goals have been pursued through protections intended to make data processing safe from unauthorized access, alteration, deletion, or transmission.

2. Mongolia

The Ministry of Health exercises the functions to determine the policy of health management and information system and provide with information (Art. 88.1.14) and to compile and publish health statistics (Art. 8.1.19), and the health authorities of provinces and capital city are responsible for compiling and providing statistics of the people of the territory and reports and information of health organizations to the relevant organizations (Art. 12.1.5). Furthermore, the sample forms of first level data, report and forms are passed by the Resolution No.450 of the Minister of Health, and the accessibility of statistics needed to determine and evaluate SDG indicators are good as compared to Governance, as the health is the industry that has the best statistics. The Resolution No.450 of the Minister of Health is planned to be revised. We conclude that it is possible to improve information by adding or redefining some indicators.

There is basically no legal basis for keeping the confidentiality of health secrets of individuals, processing such information and utilizing for statistics in Mongolia.

The law on Secrets of Individuals⁶ (1995) provides that the health secret means the information of illnesses of an individual except for his/her physical deformities and some specific infectious illnesses harmful to the public. The law further states that “the individuals shall protect their own secrets” and that state and institutions may protect the secrets of individuals on the grounds and procedure provided under the laws. The law doesn’t contain any other specific provisions.

The Law on Health⁷ (2011) stipulates that medical professionals⁸ shall provide information of the patients’ illness and deceased except for those prohibited by laws, to the relevant organizations, the individual and the family of the patient or deceased (Art. 28.4.5). The law also states that an individual may have their secret kept confidential according to the laws. The Law on Health contains a broad, but uncertain sanction that “the officials or state inspectors who have seriously breached their obligation to keep the secrecy of state, organizational and individual’s information shall be imposed disciplinary, administrative or criminal liability under the relevant laws”.

Mongolia needs new law and regulations, which allow data processors in case of using data processing software to pass on anonymised or aggregate data, from which individual patients cannot be identified, for data use purposes. Therefore, use of big data for different screening and analyses Ideally, should inform patients in advance of such uses of their personal data. If you wish to pass on personal data, including identifying details, you will need to obtain patient consent in advance. Necessary amendments should be made to the Law on Individuals’ Secret, Law on Statistics (Section 3.1.2 of this report) and the Law on Health and further research is needed to determine what aspects the amendments should cover.

USA

In the US, the HIPAA⁹ Security Rule employs this traditional solution to protecting security, and sets a floor for data security standards within covered entities. Unlike the HIPAA Privacy Rule, the HIPAA Security Rule only protects electronic protected health information (E PHI). The Security Rule

⁶ <http://legalinfo.mn/law/details/537?lawid=537>

⁷ <http://legalinfo.mn/law/details/49?lawid=49>

⁸ “medical professionals” means doctors, dentists, traditional medicine professionals, nurses, midwives, pharmacists and rehabilitation professional who have graduated from medical universities, institutes, colleges and who have permission to conduct professional activities.

⁹ The Health Insurance Portability and Accountability Act, a US law designed to provide privacy standards to protect patients' medical records and other health information provided to health plans, doctors, hospitals and other health care providers

requires covered entities that process EPHI¹⁰ to maintain sufficient security measures to ensure the confidentiality, integrity, and availability of all EPHI. The Rule enumerates specific administrative, technical, and physical security safeguards for covered entities to implement. Each safeguard is either classified as “addressable” or “required.” For the former, a “covered entity must conduct a risk analysis to determine whether each specification is reasonable and appropriate for its unique situation,” and only those safeguards that are “reasonable and appropriate” must be implemented. Required security safeguards are those mandated by the Rule.

The Rule gives covered entities the responsibility for training their workforces to comply with the security regulation and for having written security policies and procedures in place. However, covered entities are only required to protect against reasonably anticipated threats or hazards to the security of the data, and reasonably anticipated uses or disclosures of such information that are not permitted under the Privacy Rule.

Below some definitions relating to the Privacy Rule, which gives us mean ideas how is protecting personal privacy in America.

Accounting of Disclosures. This provision of the Privacy Rule gives individuals the right to receive a list of certain disclosures that a covered entity has made of their protected health information in the past 6 years, including disclosures made for research purposes.

Confidentiality. Addresses the issue of how personal data that have been collected for one approved person may be held and used by the organization that collected the data, what other secondary or further uses may be made of the data, and when the permission of the individual is required for such uses

Data Use Agreement. An agreement into which the covered entity enters with the intended recipient of a limited dataset that establishes the ways in which the information in the limited dataset may be used and how it will be protected.

Fair Information Practices. Principles affording individuals the meaningful right to control the collection, use, and disclosure of information, and imposing affirmative responsibilities to safeguard information on those who collect it.

Health Information. Any information, whether oral or recorded in any form or medium, that (1) is created or received by a health care provider, health plan, public health authority, employer, life

¹⁰ Electronic protected health information (ePHI) refers to any protected health information (PHI) that is covered under Health Insurance Portability and Accountability Act of 1996 (HIPAA) security regulations and is produced, saved, transferred or received in an electronic form

insurer, school or university, or health care clearinghouse; and (2) relates to the past, present, or future physical or mental health or condition of an individual; the provision of health care to an individual; or the past, present, or future payment for the provision of health care to an individual.

Informed Consent. A legal form required by the Common Rule that describes the potential risks and benefits of research and seeks permission to involve the subject.

Protected Health Information. Protected health information (PHI) is personally identifiable health information created or received by a covered entity.

Public Health. The Privacy Rule defines a public health authority as any “federal, tribal, or local agency or person or entity acting under a grant of authority or contract with the agency, including state and local health departments, the Food and Drug Administration, the Centers for Disease Control and Prevention, and the Occupational Safety and Health Administration.”

Security. “The procedural and technical measures required (a) to prevent unauthorized access, modification, use, and dissemination of data stored or processed in a computer system, (b) to prevent any deliberate denial of service, and (c) to protect the system in its entirety from physical harm”.

UK

Human rights cut across many issues related to the data revolution in health sector. These rights include but are not limited to the right to an identity, the right to privacy and to ownership of personal data, the right to due process (for example when data is used as evidence in proceedings, or in research), the right to know how the data about my health condition is going to be used, whether my identity and my health information is protected and principles of consent. Any legal or regulatory mechanisms, or networks or partnerships, set up to mobilize the data revolution in health sector should have the protection of human rights and privacy of personal health data as a core part of their activities, specify who is responsible for upholding those rights, and should support the protection, respect and fulfillment of data privacy. When the data is not confidential, it should be available and useable as open data, but without disclosing the identity of data owner. There must be respect for privacy and personal ownership of personal health data, and mechanisms in place so that people themselves have access to the information and are able to make choices accordingly. Crucially, people must have means for redress if they feel that they are being harmed or their rights infringed by the use of their data.

The confidentiality of patient records is central to the ethical tradition of medicine and health care. This tradition of confidentiality is in line with the requirements of the Data Protection Acts 1988 & 2003, under which personal data must be obtained for a specified purpose, and must not be disclosed to any third party except in a manner compatible with that purpose. Given the immense sensitivity of health-related information, it is imperative that professionals in this sector be clear about their use of personal data¹¹.

In UK, all researchers and consultants conducting surveys funded by international organizations should fill out a Consent Form and get it approved by the Ministry of Health. All patients who participate at surveys or give their personal information, medical records or even samples of their blood, urine etc for medical test, should be made aware of in advance how researchers intend to use their data for your their research purposes. However, the Acts provide that such uses of personal data are permitted, even where the patient was not informed in advance, provided that no damage or distress is likely to be caused to the individual.

Consent forms are widely used in the health sector research and data collection and they are a basic legal principle that reflects a person's agreement to something. In a healthcare context it means a person's agreement to something being performed on them or a sample being taken from them. Informed consent, in a legal sense, reflects that a patient has received the information relevant to them to make an informed decision and they have given permission for the healthcare to be provided. In an ethical sense the provision of informed consent by a patient reflects the end point of a process of engagement in which one or more health practitioners have supported the patient to come to an informed decision to agree to the healthcare offered.

¹¹ Data Protection Comissioner, <https://www.dataprotection.ie/docs/The-Medical-and-Health-Sector/245.htm>

ANNEX V: LIST OF KEY INFORMANTS IN HEALTH SECTOR

Table 11 - List of Key Informants in Health Sector

	Name	Position	Institution	Which SDG Health Indicators can be obtained from this source
1.	D.Uranchimeg	Clinical Manager at Intermed hospital	Intermed private hospital	3.5.1,3.5.2, 3.8.1
2.	G. Nyamkhorol	Head of quality management department, Previous: Head of Data monitoring department	Intermed Private hospital Ministry of Health, Head of Data Monitoring department (responsible for Health-Data Database)	3.5.1,3.5.2, 3.8.1
3.	B. Suvdaa	Deputy director	Public Health Institute	3.5.1, 3.5.2, 3.8.1, 3.9.1, 3.9.2, 3.b.1
4.	S.Erdenebayar	Statistician/doctor	Selenge province, Zuunburen soum	3.5.1, 3.5.2, 3.8.1, 3.9.1, 3.9.2, 3.b.1
5.	R.Bazarragcha	Project Team Leader	International “Stream” project on Tuberculose testing by Hospital for infectious diseases	3.8.1.

ANNEX VI: Methodologies for Calculation of Indicators in Health Sector

1. Treatment Interventions for Substance Use Disorders (Indicator 3.5.1)

Narcotic drug causes most harmful effects to the central nervous system. “Narcotic and psychotropic drug” means drugs, and bio preparations whether natural or synthetic provided in the list of the UN Single Convention on Narcotic Drugs 1961 and should be under state control.

According to the World Health Organization, substance use disorder should not be considered only as a crime but it should be considered as a public health problem. Public health approach is evidence-based and scientific. This approach tells quite good information about the patient. It’s possible to treat and prevent drug use disorders and reduce crime related drug use based on this approach. People who are dependent on drugs can be helped and changed as a useful person to society. Multi-functional, comprehensive measures to achieve these goals are supported by the World Health Organization.

As surveys from other countries show, the most efficient method to determine the total number of drug users, as recommended by the World Health Organization, is to supply disposable syringe and give opioid substitution therapy to opioid dependent people in poor countries. It has been proven that this type of program has a good result not only for individuals, but for the society like it is resulted in reduced crime and improved public order.

I used to work in Hong Kong. We had one of the most robust, liberal harm reduction programme: methadone replacement. After its implementation, petty crimes that addicts commit to feed their addiction were reduced. I speak from personal experience. I would encourage governments to consider such programmes. They are not easy, but they work.

from the speech of Dr Margaret Chan, Director-General of the World Health Organization

So we can achieve more results, if we will implement this type of projects and programs.

2. Alcohol per Capital Consumption (Indicator 3.5.2).

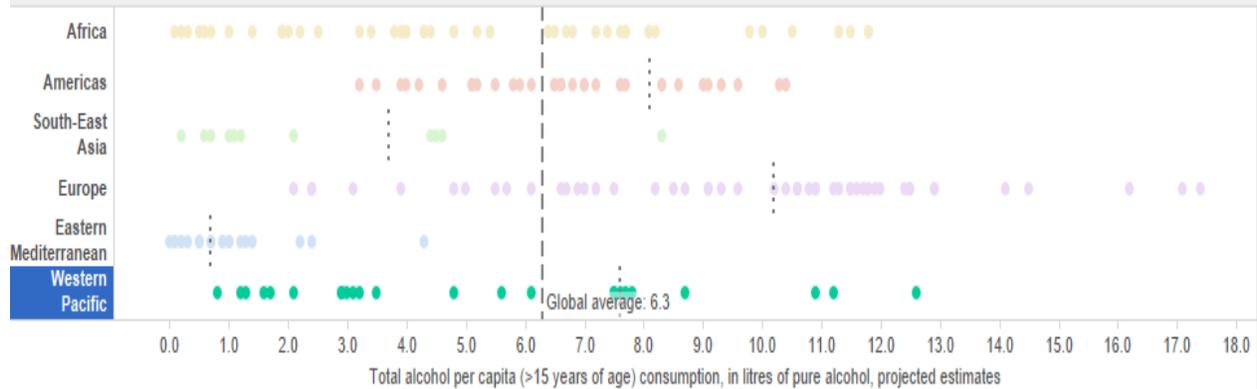
The indicator is defined and calculated by the following method and reported into non-contagious disease surveillance system of the WHO from the countries involved (see Appendix XXX for calculation method)

Alcohol per capita consumption

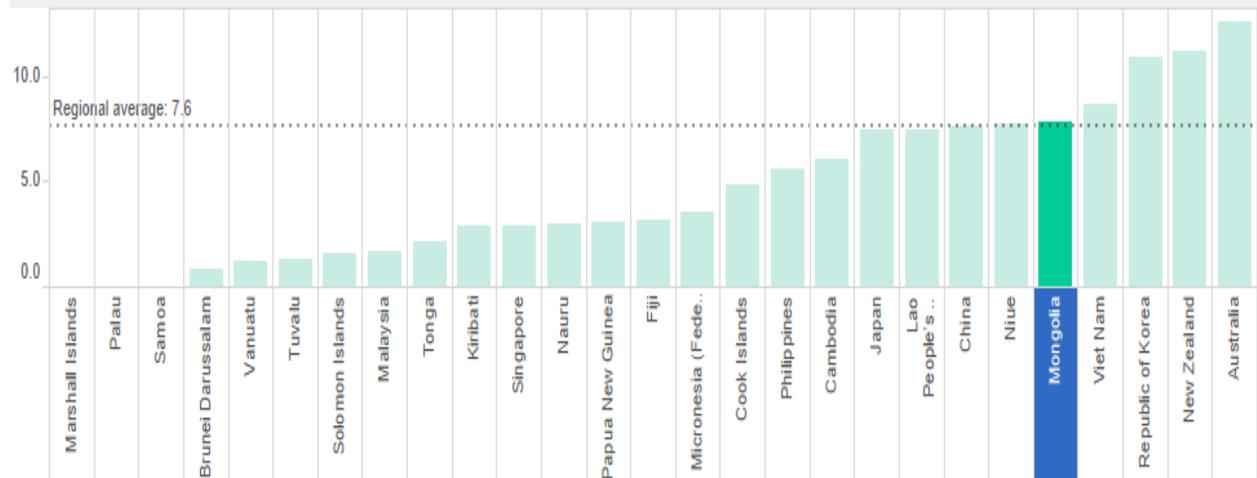
Globally, alcohol consumption in 2015 was projected to be 6.3 litres of pure alcohol per person ages 15 or older

Each circle/bar represents a country. The dotted grey line indicates the regional average, and the dashed grey line indicates the global average.
Click on a region name to display the distribution by country (within that region) as a bar graph.

Total alcohol per capita (>15 years of age) consumption, in litres of pure alcohol, projected estimates, by WHO region, 2015



Distribution by country (in selected WHO region) mouse-over the y-axis to sort



© World Health Organization 2016 | Source : Global Health Observatory (<http://www.who.int/gho>)

Source: Harmful use alcohol, World Health Statistics 2016 data visualizations dashboard, <http://apps.who.int/gho/data/node.sdg.3-5-viz?lang=en>

As these concepts and definitions have already been launched and used in other countries, this should be used directly in Mongolia.

3. Air Pollution Attributable to Deaths (Indicator 3.9.1.)

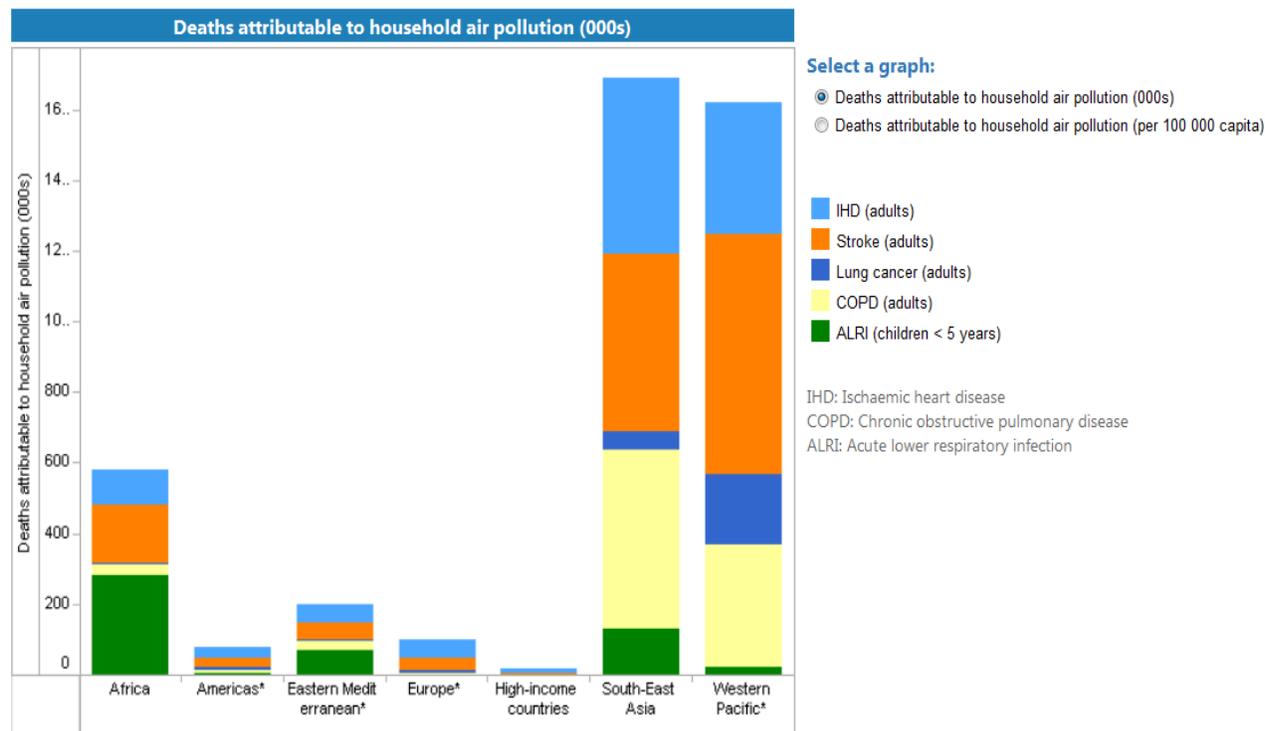
Industries, households, cars and trucks emit complex mixtures of air pollutants, many of which are harmful to health. All of these pollutants and fine particulates have the greatest effect on human health. Most of fine particulates come from fuel combustion, both from mobile sources such as vehicles and from stationary sources such as power plants, industry, households or biomass burning. Fine particulate matter is associated with a broad spectrum of acute and chronic illness, such as lung cancer, chronic obstructive pulmonary disease (COPD) and cardiovascular diseases.

4.3 million people die yearly prematurely from illness attributable to household air pollution caused by inefficient use of solid fuels (2012 data) for cooking. Among these deaths:

- 12% are due to pneumonia
- 34% from stroke
- 26% from ischaemic heart disease
- 22% from chronic obstructive pulmonary disease (COPD), and
- 6% from lung cancer.

Ambient air pollution was responsible for 3.7 million deaths, representing 6.7% of the total deaths (WHO, 2012). Worldwide, ambient air pollution is estimated to cause about 16% of the lung cancer deaths, 11% of chronic obstructive pulmonary disease (COPD) deaths, more than 20% of ischaemic heart disease and stroke, and about 13% of respiratory infection deaths. Particulate matter pollution is an environmental health problem that affects people worldwide, but low- and middle-income countries disproportionately experience this burden.

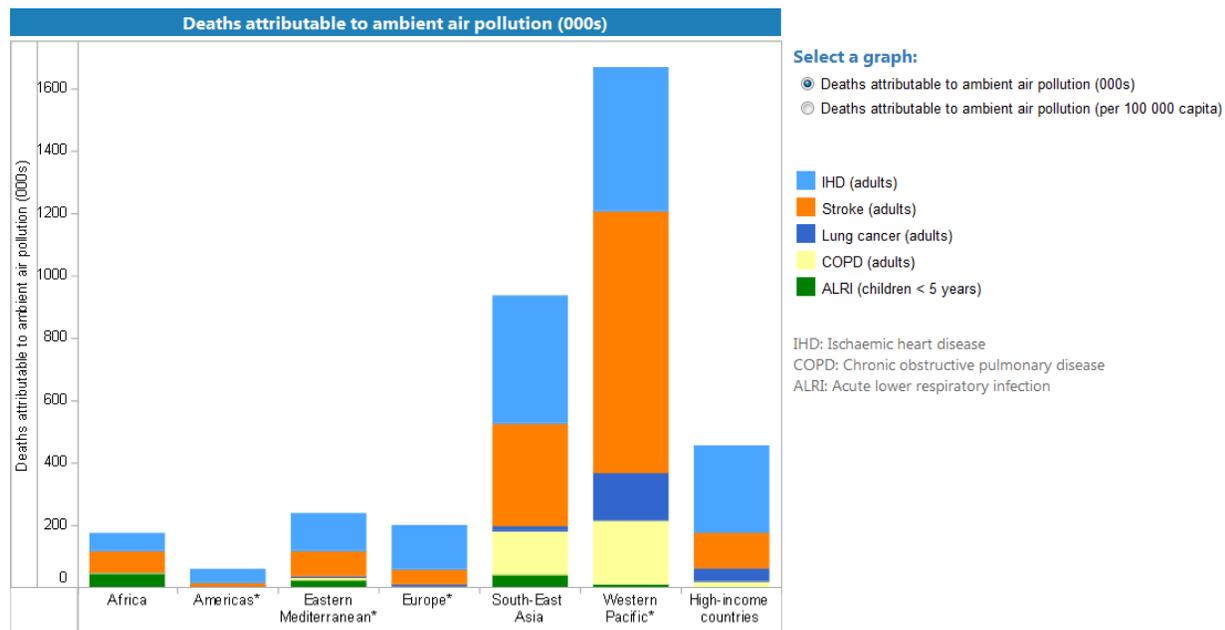
Household Air Pollution Attributable to deaths, by Region, 2012 (Indicator XX)



* low- and middle-income countries

Source: <http://apps.who.int/gho/data/node.wrapper.ENVHEALTHHAP?lang=en&menu=hide>

Ambient Air Pollution Attributable Deaths, by Region, 2012



* low- and middle-income countries

Source: <http://apps.who.int/gho/data/node.wrapper.ENVHEALTHHAP?lang=en&menu=hide>

The WHO computes death cases caused from lung cancer, chronic obstructive pulmonary disease (COPD) and cardiovascular diseases (ischaemic heart disease and stroke) based on outdoor and indoor air pollution. Therefore, statistical estimate on incidence rates should be made annually from health statistical office. The WHO computes death cases caused by acute lower respiratory infection of children under 5.

Thus, constructing an environmental health surveillance system based on the Public Environment Toxicology Center of the Ministry of Health is in the planning stage. Air pollution data directory days, 7 days, monthly, quarterly and annual surveillance should be done by connecting the system to the new construction.

It's clear that improving financial and human resource capacity is necessary while creating surveillance unit.

4. Mortality Rate Attributed to Unsafe Water (Indicator 3.9.2)

"Water and Sanitation is one of the primary drivers of public health. I often refer to it as "Health 101", which means that once we can secure access to clean water and to adequate sanitation facilities for all people, irrespective of the difference in their living conditions, a huge battle against all kinds of diseases will be won."

Dr LEE Jong-wook, Director-General, World Health Organization

Worldwide, 780 million people do not have access to an improved water source (WHO and UNICEF, 2012). An estimated 2.5 billion people lack access to improved sanitation (more than 35% of the world's population) (WHO, 2008). According to the World Health Organization and UNICEF, regions with the lowest coverage of "improved" sanitation in 2006 were sub-Saharan Africa (31%), Southern Asia (33%) and Eastern Asia (65%).

An estimated 801,000 children younger than 5 years of age perish from diarrhea each year, mostly in developing countries. This amounts to 11% of the 7.6 million deaths of children under the age of five and means that about 2,200 children are dying every day as a result of diarrheal diseases (Liu L, Johnson HL etc, 2012). Unsafe drinking water, inadequate availability of water for hygiene, and lack of access to sanitation together contribute to about 88% of deaths from diarrheal diseases. Worldwide, millions of people are infected with neglected tropical diseases (NTDs), many of which are water and/or hygiene-related, such as Guinea Worm Disease, Buruli Ulcer, Trachoma, and Schistosomiasis. These diseases are most often found in places with unsafe drinking water, poor sanitation, and insufficient hygiene practices (WHO, 2006). Guinea Worm Disease (GWD) is an extremely painful parasitic infection spread through contaminated drinking water. GWD is characterized by spaghetti-like worms up to 1 meter in length slowly emerging from the human body through blisters on the skin anywhere on the body but usually on the lower legs or lower arms. Infection affects poor communities in remote parts of Africa that do not have safe water to drink. In 2014, 126 cases of Guinea Worm Disease were reported. Most of those cases were from Sudan (56%) (WHO, 2015).

- Thus, when calculating deaths attributed to unsafe drinking water and inadequate sanitation, the following diseases should be integrated from health statistical information:

- Infectious diarrhea
- Cholera
- Salmonellosis
- Shigellosis
- Typhoid
- Hepatitis A
- Other bacterial, protozoal and viral intestinal disease.

The hepatitis A, schistosomiasis disease and diarrheal are considered as reasons of unsafe drinking water, inadequate sanitation hygiene consequential deaths. Therefore, health statistics should make the annual incidence of mortality cases caused from these diseases and estimate incidence rates.

ANNEX VII: KEY ELEMENTS FOR A FUNCTIONAL DATA ECOSYSTEM IN GOVERNANCE

Interviews: First it was necessary to define traditional and non- traditional data sources, the availability, and statistical capacity of existing data stakeholders for determination of missing indicators of SDGs. Thus, approximately 10 days, from July 18 - August 1, 2016, numerous face to face meetings and interviews were conducted with over 41 key data stakeholders of traditional and non-traditional data sources (Table 12). This included a wide range of participation by government officials including executive, legislative, and judicial experts and development practitioners, international organizations, academia, and civil society organizations. The interviews and questionnaire covered the following topics in defining current conditions and required actions for strengthening of the data ecosystem in the promotion of the data revolution for a better implementation and monitoring of the post 2015 agenda.

- Leadership and institutional engagement
- ICT infrastructure and Big Data Technologies
- Human resource and capacity
- Data quality and reliability

The data ecosystem consists of multiple data communities, their interacting with one another on all types of data, implementing and using innovative technologies on data value chain and enabling and functioning of legal framework implementation. According to our current traditional perspectives, the data ecosystem mainly represents the traditional data sources. However, in the frame of a concept of the data revolution, the data ecosystem recognizes the importance of non-traditional data sources, data innovations, knowledge and information created by data communities. In this respect, this study made an analysis for the implementation of the data revolution, especially the indispensable merging of traditional and non-traditional data created by data communities in order to determine national and global indicators.

Table 12 - Data stakeholders for Goal 16

No	Key Data Stakeholders - Traditional data	Quantity	Indicator's code
1	International Indicators	2	16.8.1, 16.10.2
2	Peace-crime/General Police office	7	16.1.1, 16.1.2, 16.1.4, 16.3.1, 16.4.1, 16.4.2, 16.10.1,
3	Human Rights /NHRC	4	16.1.3, 16.2.3, 16.a.1, 16.b.1
4	Children's Rights /National Center of Children	1	16.2.1
5	Justice/ General Prosecutor office and General Counsel of Court	1	16.3.2
6	Justice/ Independent Agency Against Corruption (IAAC)	2	16.5.1, 16.5.2
7	Effectiveness /Ministry of Finance	1	16.6.1
8	Effective and inclusiveness /Civil Service Council	1	16.7.2
9	Law inclusiveness/ NRSO	1	16.9.1
10	Effectiveness and accountability of Institution /Ministries& Cabinet of Secretary	3	16.6.1 16.6.2, 16.7.2,
No	Key Data Stakeholders-Non-traditional data	Quantity	Indicator's code
1	Save the Children	1	16.2.1
2	Gender Equality Center	2	16.1.3, 16.2.3,
3	Mongolian Women's Fund	4	16.1.3, 16.2.3, 16.a.1, 16.b.1
4	Transparency International	2	16.5.1, 16.5.2
5	Open society institute	4	16.1.3, 16.2.3, 16.a.1, 16.b.1
6	The Asia Foundation	2	16.5.1, 16.5.2
7	Swiss Development Agency	3	16.6.1 16.6.2, 16.7.2,
8	Globe International	1	16.10.1
9	World Vision	1	16.2.1
10	Human Rights Center	4	16.1.3, 16.2.3, 16.a.1, 16.b.1

Leadership and Institutional Engagement: As part of the methodology, the consultants conducted a thorough identification of the data stakeholders who are accountable and responsible for indicators related to Goal 16. There is no overall ownership of several indicators such as 16.6.1 16.6.2, and 16.7.2. According to the study, the Cabinet Secretary can be an ideal body for overseeing the implementation and consolidation of data for reporting of the above indicators. Also, various stakeholders and CSOs produce annual reports with their respective core business but, there is a key body that needs to be identified for integration of traditional and non-traditional data for measuring of national and global Indicators. For example, the General Police Office has its data on victims of sexual abuse and also, particular NGOs have its own data on this. Each police unit reports to its own line offices and it consolidates as national data at the General Police Office. But, CSOs or NGOs data

are mainly for their own use. That data is not included in overall statistical reporting. It is difficult to produce a nation-wide picture on a certain issue mainly for two reasons 1) some victims do not report to competent authorities, thus, it is not easy to define real data on those cases. Thus, the police information cannot be fully representative to describe national indicators 2) there is no system to collect primary data from CSOs, or NGOs for integrating and reporting. Thus, in order to implement Goal 16, we need to look at the possibility of creating a system for monitoring, implementation and reporting of Governance.

ICT Infrastructure and Big Data Technologies: All governmental organizations have its own comprehensive ICT and human resources to manage the ICT in terms of data management and ICT infrastructure. The Judicial System reformed its ICT with assistance of the World Bank. Thus, the Judicial System has the ability to gather data from all of its system entities. There is almost no gap between central and local authorities of the Judiciary on sharing and exchanging information in real time.

The Ministry of Justice is implementing to create a consolidated ICT system for the General Police Office, the General Prosecutor Office, the Court, and the Court Authority of Enforcement and Decisions of Courts. That means, there is the ICT standard for smooth operating and reporting of this system. The IAAC has its own system. Currently, they are working on creating an internal system to access all different ICTs within the organization. National and local government organizations have their own ICT system which is partially publicly accessible to participate in commenting on a certain public service, however, it is a still some limitations of having full information. CSOs or Local NGOs need a solid software program to register their beneficiaries, they mainly use an excel sheet based registration. Currently the CSO acts as data producer, and user but does not have the financial means to fund a statistical system and collect data regularly.

Human Resource capacity: During the study, also, identification of the situation is analyzed concerning the capacity in human resources of data management including data collectors, data entry officers and data analyzers' need for training in producing quality of comprehensive reporting. Almost all data stakeholders including most IT specialists and data collectors said the importance of organizing on-going capacity building programs and implementing of user friendly ICTs are needed. Both Governmental organizations as well as CSOs noted that having statisticians in their Monitoring and Evaluation Departments was important. National standardized survey methodology and its' accessibility are required for all data stakeholders. The reality is, many M&E departments of Governmental offices do not have specialized human resources such as statisticians. A stability of

human resources in public organizations particularly in rural areas is crucial in strengthening of the data ecosystem mapping. Currently, there is a huge challenge in keeping professional personals in rural areas. Thus, governmental organizations need to take various measures for attracting and promoting highly professional personnel in rural statistical jobs.

Data quality and reliability: Both administrative and open data follows principles of official statistics and ensures all data quality, disaggregation, accuracy, timeliness and completeness. However, some data stakeholders share that the quality of data they produce for internal use is of low quality due to: inadequate assessment of user needs, lack of mechanisms for assessing user needs in sectors, non-compliance within international standards and guidelines in data collection, and lack of a comprehensive statistical program to build their internal capacities. Some stakeholders also responded that some of their data sources are not good, lack of standardized tools for data collection, inadequate training and supervision of data collectors, inadequate automation of the statistical system, inadequate data management, lack of coordination of data sources, and inadequate data dissemination.

These mix of experts underlined the importance of identifying the right method for measuring Goal 16.

- Endorse consensus documents on national and global indicators, their relevance, the importance of complementary and supplementary indicators, and disaggregation.
- Integrated methods for measuring, monitoring and reporting of SDGs need to be adopted. So all data stakeholders can use the same method for data management in order to contribute in the measuring of Indicators.
- Strengthen data collection mechanism covering education and raising awareness on peace, justice and inclusiveness and access to service and reporting among the general public.
- Identify third parties such as CSOs and private sectors engagement, and carry out particular indicators.
- NSO needs to provide technical capacity on data management for all data stakeholders
- Create a governing body for ensuring implementation, monitoring, and evaluation, reporting and re-planning for SD.
- Create a legislative environment for coordination and regulations on relations with open data sources from third parties and data sharing and exchange between the governmental organizations, private and CSOs etc.,

Goal 16 can be measured by using technologies and methodologies: If we look at the indicators of Goal 16, it can be measured by the combination of administrative and survey-based data. NSOs have been engaged in household surveys for decades. New modules for household surveys on conflict, displacement, social cohesion, rule of law and governance could be introduced. The NSO needs to work with third party civil society, multilateral and development agencies, and academic actors as well as private companies. This could bridge today’s expertise to greater future capacity. New technologies including high frequency cellphone surveys and increased internet access are a few examples. These could cut costs and simplify many of the indicators. For instance, the following indicators related data can be collected via internet access and cellphones.

16.1.4	Proportion of population that feel safe walking alone around the area they live
16.6.2	Proportion of population satisfied with their last experience of public service
16.7.2	Proportion of population who believe decision-making is inclusive and responsive, by sex, age, disability and population group

Collaborative relationship between the mobile service providers and specialized CSOs can build statistical numeracy and trust between data users and producers necessary for an effective evidence-based policy.

Legal Issues

If the government accepts our recommendations, provided in the section 5.2.1 of this Report, there is no legal barriers to collect necessary data to evaluate the Governance indicators i.e, there is no need to amend or change any existing law or to approve a new law. The result of our determination and evaluation of 15 indicators that are referred to as those need to be determined in unconventional methods or in combination with conventional method in this chapter indicates that, there is no barriers of legislation. We included our Comments/Recommendations in Table 15 ANALYSIS ON EACH MISSING GOVERNANCE INDICATORS, based on our interview with participants and comparison of legal provisions establishing the authority of relevant government organizations in relation to the indicators.

Recommendation for Data management in Data Revolution: As part of open data initiatives in the promotion of transparency of public services, the government of Mongolia has achieved significant progress in the promotion of transparency in the public sector and access to the public information and service via e-government, transparent budget, e-reporting and e-land privatization, e-procurement, and e-vat. However, in order to promote better data collecting and sharing, digital

literacy is very important for the general public in order to be a part of this initiative and actively participate in its development. Thus, investment for education of digital literacy for all needs to be considered as an important measure for implementation of a concept of “no one is left behind SD”. There are many indicators for which there is no direct ownership, legislative systematic actions and mechanisms are needed in order to ensure a robust data revolution for the result based implementation of development including i) a governing governmental body needs to be established in order to promote legislative structure, implementation, coordination and monitoring a sound SDGs implementation, ii) also, a mechanism needs to be set up through which technology and innovation can be shared and used for the common good. During the study, the selected data stakeholders proposed a national “Network of Data Innovation to bring together the organizations and experts in the field. This would contribute to the adoption of the best practices for improving the monitoring of SDGs, identify areas where common data-related infrastructures could address capacity problems and improve efficiency, encourage collaborations, identify critical research gaps and create incentives to innovate, iii) reviewing and appraising the adequacy of existing laws or creating and improving legislation on access and use of the open data as well as coordination between the administrative and open data for the implementation of SDGs and its monitoring as well as promotion of the data revolution.

Sustainable Development Goals’ Indicators	
Data Revolution	
Merging of Traditional and Non-Traditional Data Source/Data Innovation	
Traditional Data Source	Non-Traditional Data Source

Focus group discussions: Thematic dialogue on Governance was conducted at the UN Mongolia House on August 3, 2016. In the following table 4 shows joint recommendations of over 35 participants representing the government and non-governmental organizations as outcomes of the thematic dialogue.

All participants were informed concerning the proper timing of the promotion of a robust data revolution in order to ensuring accurate and adequate development data for acceleration of development and achievements of the SDGs. All data stakeholders shared their willingness and commitment in sharing data without touching an individual’s privacy or protection or neglecting any issues relating to human rights.