FOR PARTICIPANTS ONLY
REFERENCE DOCUMENT

LC/CEA.12/DDR/2
26 September 2023

ORIGINAL: ENGLISH

23-00862

Twelfth meeting of the Statistical Conference of the Americas
of the Economic Commission for Latin America and the Caribbean

Santiago, 26–28 September 2023

DIAGNOSIS AND RECOMMENDATIONS TO INTEGRATE ADMINISTRATIVE RECORDS RELATED TO CHILDREN

Use of administrative records for better statistics on children and adolescents

This document was prepared by the working group to develop Recommendations for the integration of administrative records related to children, of the Statistical Conference of the Americas (SCA) of the Economic Commission for Latin America and the Caribbean (ECLAC). The group was coordinated by the National Institute of Statistics (INE) of Chile and the National Institute of Statistics (INE) of Uruguay. The United Nations Children's Fund (UNICEF) and the Statistics Division of the ECLAC served as technical secretariat. The member countries are: National Institute of Statistics and Censuses of Argentina, National Institute of Statistics of the Plurinational State of Bolivia, Brazilian Institute of Geography and Statistics, National Administrative Department of Statistics of Colombia, National Office of Statistics and Information of Cuba, Department of Statistics and Censuses of El Salvador, National Institute of Statistics and Geography of Mexico, National Institute of Development Information of Nicaragua, Department of Statistics, Surveys and Censuses of Paraguay, National Institute of Statistics and Informatics of Peru, and National Bureau of Statistics of the Dominican Republic.

Acknowledgements

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We also acknowledge the advice received from the following experts: Karen Carter, Danzhen You, Yves Jacques and Yanhong Zhang (UNICEF HQ), Xavier Mancero and Daniel Taccari (ECLAC), Dafna Kohen (Statistics Canada, Government of Canada), Andy Handouyahia (Employment and Social Development, Government of Canada), Christine Minas (Health Canada, Government of Canda), Kyle Burns (Canada School of Public Service, Government of Canada) and Christopher Allison (Public Health Agency of Canada, Government of Canada).

We are thankful to those who participated in providing answers to the written questionnaire, shared documents and participated in semi-structured interviews to help inform this report. We acknowledge the many representatives from each of the 21 NSOs who kindly agreed to share information (*see Annex 1 for the individual contributors*).

Finally, we also acknowledge the collaboration of many UNICEF representatives who helped coordinate discussions and the information collection.

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Abbreviations and Acronyms

ADaMM	Administrative Data Maturity Model
COVID-19	Coronavirus disease 2019
ECLAC	Economic Commission for Latin America and the Caribbean
GDPR	European Union's General Data Protection Regulation
IDB	Inter-American Development Bank
IMCRA	Instrument for Measuring the Quality of Administrative Records
LAC	Latin America and the Caribbean
MICS	Multiple Indicator Cluster Surveys program
NSO	National Statistical Office
SDG	Sustainable Development Goals
RD4C	Responsible Data for Children
UN	United Nations
UNECE	United Nations Economic Commission for Europe
UNICEF	United Nations Children's Fund
UNSD	United Nations Statistical Division
UNSDG	United Nations Sustainable Development Group
SWOT	Strengths, weaknesses, opportunities and threats

Executive Summary

By adopting the 2030 Development Agenda and the Sustainable Development Goals (SDG) monitoring framework, countries are working towards improving the livelihoods and prospects for children and adolescents to ensure they reach their full potential. To this end, it is key to understand the circumstances in which they live, the barriers they face as well as which programmes and policies work for whom and under what conditions. One cannot improve what is not measured, and disaggregated data on children and adolescents by important dimensions, such as sex and gender, help to uncover how circumstances, barriers and needs may differ by subgroups.

This readiness diagnostic for the linking, integration and development of administrative data related to children and adolescents is aimed at improving statistical systems. More specifically, it recommends actions which will improve the quality and use of administrative data to inform the design of public policies for children and adolescents and as well as for the monitoring of the SDG agenda. This differs from the use of administrative data for administrative purposes such as program delivery.

The importance of leveraging administrative records for strategic policy purposes has been widely recognized by governments and non-profit organizations. This was underlined by Anders Wallgren and Britt Wallgren in the 2021 report prepared for the Inter-American Development Bank (IDB), "Towards an Integrated Statistical System Based on Registers", in which the enormous potential for public sector statistics to deliver better results is explained. This potential is also articulated by UNICEF in the Administrative Data Maturity Model (ADaMM).

This diagnostic comprised a series of questions covering four themes (*see written questionnaire in Annex 2*) which determined the maturity of statistical systems in the region in terms of readiness to link, integrate and develop administrative data. The four themes are as follows:

Theme 1: Scoping, intended to assess the extent to which an NSO has identified specific needs and data sources for linking and integrating administrative data, with a special focus on children's data.

Theme 2: Governance, intended to assess the legal and administrative structures and determine if they are adequate to support the linkage and integration of administrative data, including those related to children and adolescents.

Theme 3: Data issues, intended to assess the readiness of NSOs to receive data, prepare it for linkage, integration and development and share it safely while simultaneously protecting the privacy of the information.

Theme 4: Information technology, human resources and other issues, intended to determine the readiness of systems in terms of structures, software and computers for storing, retrieving and securely sharing information. This last theme also included human resources, change management, budget, communication activities and support needed from outside the NSO.

Overall, the diagnostic showed that the 21 NSOs who participated in this initiative are in strong leadership positions as data stewards in their respective countries and this is recognized as an important strength on which they can build going forward. Additionally, the NSOs all identified areas where external support would be welcomed, and common challenges were identified. For example:

- NSOs report a level of lack of understanding by government ministries and agencies of the benefits of administrative data linkage, integration and development for statistical purposes, and of the NSO's capacities to manage associated risks including data privacy and security.
- NSOs tend to consider ministries and agencies as data providers only, not as stakeholders and data users.
- NSOs need to further refine or develop appropriate governance frameworks.

While each country's system is unique in terms of its readiness to link, integrate and develop administrative data related to children, four typologies of systems are identified.

Type 1: Implementing. These NSOs are already working with partners to link, integrate and develop administrative data on children and adolescents. They are addressing a few remaining issues in their systems as they are implementing their data linkage and integration projects and platforms. The NSOs of **Costa Rica and Uruguay** are categorized as Type 1.

Type 2: Enabling. The NSOs in this category are currently enabling administrative data linkage and integration. They have the capacity to engage data providers to identify needs for platforms linking and integrating administrative data related to children and adolescents. However, they have yet to begin to develop data platforms due to addressing other priorities, including systematic or foundational elements. The NSOs of **Chile, Honduras, Mexico and Peru** are categorized as Type 2.

Type 3: Initiating. The NSOs in this category are interested in leveraging more value from administrative data in their country, however they need to address many systemic or foundational elements first. They do not yet plan to engage data providers on their needs for data platforms. The NSOs of **Bolivia, the Dominican Republic, Panama and Paraguay** are categorized as Type 3.

Type 4: Contemplating. Situations for NSOs which are contemplating data platforms vary greatly. However, NSOs in this category are aware of the potential of developing administrative data linkage and platforms and are considering the opportunities and multifaceted challenges as they are missing many systemic or foundational elements that will need to be fixed before being able to produce data platforms. The NSOs of **Argentina, Belize, Brazil, Cuba, El Salvador, Guatemala, Jamaica, Nicaragua, Saint Lucia, Suriname and Venezuela** are categorized as Type 4.

Based on the findings, 11 general recommendations were defined, including actions supported by a proposed mitigation of associated risks, indicators of progress and other related considerations that are detailed in Section 6. The recommendations are organized into four thematic areas: demand (scope), governance, data issues and information technology and human resources, along with other issues.

It is important to note that while these recommendations apply to the 21 participating NSOs and focus on drawing insights on children and adolescents, the recommendations are more broadly applicable. Given the nature of statistical systems built on administrative data, many of the recommendations relate to

systemic and foundational issues for data linkage, integration and development in general and not to data on children and adolescents specifically. However, improving the quality and use of administrative data for children and adolescents is the agenda promoted by the working group with this report.

The 11 recommendations, including a summary of actions, are listed below:

Demand (scope)

Recommendation 1: Strategically undertake or expand activities for the development of platforms linking and integrating administrative data through standalone projects or through the integration of existing platforms with the view to actioning short-term activities which build towards long-term strategies.

Action:

- While building towards long-term strategies, NSOs should plan to experiment with the development of small-scale and perhaps sectoral or cross-sectoral platforms linking and integrating administrative data.

Recommendation 2: Build an approach to the acquisition and linkage of administrative data that considers stakeholder needs and recognizes the reciprocity of the relationship between institutions.

Action:

- Include a yearly consultation process, with key ministries and agencies, on their needs for the linkage, integration and development of administrative data. NSOs should also consider supporting key ministries and agencies with research capacities to promote the use of administrative data for statistical purposes.

Governance

Recommendation 3: Promote safe access and seamless use of platforms linking and integrating administrative data for statistical use outside the NSO, including stakeholders, data users, decisionmakers and researchers.

Action:

- Implement and communicate user-friendly protocols and technology for external users to access and use data platforms.

Recommendation 4: Promote transparency by informing stakeholders about the secure activities undertaken to link and integrate administrative data for policy development, service improvements and reporting on results.

Action:

- Include a data linkage, integration and development workplan embedded in the NSO annual strategic plan.

Recommendation 5: Build and maintain public trust in the use of linked administrative data for statistical purposes while demonstrating the positive impact of the data.

Action:

- Measure levels of public trust within the country and develop strategies for building and maintaining this trust.

Recommendation 6: Promote a legal framework that reinforces the role of the NSO in acquiring administrative data for statistical purposes.

Action:

- Create a senior committee or mandate an existing committee for legislative review.
- Elaborate guidelines with the required technical criteria, both for the provision and production of statistical data.

Data issues

Recommendation 7: Strengthen the development and use of tools for measuring the quality of administrative data and linked administrative data for statistical purposes on children and adolescents including quality indicators such as: completeness, coverage, consistency, validity, timeliness and accessibility of the data.

Action:

- Develop and apply measurement instruments in NSOs that do not have such instruments.

Recommendation 8: Adopt a set of broadly used and accepted principles for the provision of safe access and usage of administrative data for statistical purposes.

Action:

- Alignment of administrative data management activities to the Five Safes Internal Audit Program which promotes robust risk management including data anonymization and strong ethical safeguards.

Recommendation 9: Strengthen the organizational structure and clarify roles and responsibilities for data linkage, integration and development activities within the NSO.

Action:

- A formal committee structure could include a data linkage committee to oversee organizational structure.

Information technology, human resources and other issues

Recommendation 10: Plan in advance for the technological and human resource elements necessary to implement data linkage, integration and development.

Action:

- Map out future needs including, for example, data architects or scientists, analysts, technical support, central repository capacity (e.g., data warehouse), hardware and software.

Recommendation 11: Attract talent to the NSO.

Action:

- Implement an assignment programme for strong technical professionals to join the NSO on a temporary basis to work on special administrative data related projects. In parallel, develop career pathways and strategies to retain talent.

As more general population administrative data are produced and used for statistical purposes, it is important to ensure that integrated statistical systems of administrative data are invested in, built and maintained in a manner that considers the unique attributes of children's and adolescents' data and that its use is promoted for the greatest impact for children. As a first step, this diagnostic focuses on the demand for linked administrative children's data for statistical

purposes with consideration for close links with population-level linked administrative data. Future technical products may be developed and will focus on the contextual, technical and governance considerations which differentiate children's administrative data from other types of administrative data used for statistical purposes. Many countries are already conducting testing and experimenting with linkage of cross-sectoral platforms to begin to integrate administrative data.

Key concepts

The following key concepts are defined for the purpose of this document and should be read as such.

Administrative data: According to the UNICEF Administrative Data Maturity Model (ADaMM), administrative data refers to data (from administrative records) collected through the routine delivery of a service rather than a targeted one-off data collection tool such as a survey. In other words, the collection of data for statistical purposes is not the primary reason the system exists. The data is collected as an integral part of the routine management of client interactions, supply, planning and delivery of a product or service across a defined population (usually a national or large subnational area). Moreover, Statistics Canada identified four distinguishing features of administrative data for statistical use:

- The agent that supplies the data to the statistical agency and the unit to which the data relate are different (in contrast to most statistical surveys).
- The data were originally collected for a definite non-statistical purpose that might affect the treatment of the source unit.
- Complete coverage of the target population is the aim.
- Control of the methods by which the administrative data are collected and processed rests with the administrative agency (or line department).

Anonymization: Anonymization is the process of rendering personal data anonymous. According to the European Union's General Data Protection Regulation (GDPR), anonymous data is information which does not relate to an identified or identifiable natural person or personal data rendered anonymous in such a manner that the data subject is not or no longer identifiable.

Data custodians: The organization that manages administrative or research datasets and collects and stores directly identifying information (such as name, address or date of birth) as well as information about the person (such as participation in social programmes or activities).

Data platforms: A data platform brings together administrative data that has been processed, possibly linked, integrated and developed for statistical purposes. In the context of this report, data platforms include person-level data which has been linked across administrative datasets. Data platforms allow users to create statistics and conduct analyses.

Data users: Data users access microdata to create aggregate statistical outputs for research and analysis. A data user may be a client, but this is not necessarily the case.

Deidentification: A data minimization technique in which personal identifiers are removed, but the rest of the dataset is left untouched. Deidentification does not typically anonymize data.

Encryption: The conversion of data from a readable format to an encoded format, which can only be read or processed after having been decrypted.

Geographic data: A set of attributes represented through numbers and characters that describe or identify spatiotemporal phenomena related to a territory.

Identifiers: Data that by themselves are associated in a unique way with a natural or legal person.

Interoperability: According to the Global Partnership for Sustainable Development Data, interoperability is the ability to access and process data from multiple sources without losing meaning, and then integrate those data for mapping, visualization and other forms of representation and analysis. Interoperability enables people to find, explore and understand the structure and content of datasets.

Indirect identifiers: Data that could be used by someone who has knowledge about an individual in a dataset to identify that individual.

Personal data: According to the United Nations Development Group (UNSDG) personal data means data, in any form or medium, relating to an identified or identifiable individual who can be identified, directly or indirectly, by means reasonably likely to be used, including where an individual can be identified by linking the data to other information reasonably available. Personal data is defined by many regional and national instruments and can also be referenced as personal information or personally identifiable information.

Privacy: According to a 2013 report of the Special Rapporteur to the Human Rights Council (A/HRC/23/40) privacy is defined as "the presumption that individuals should have an area of autonomous development, interaction and liberty, a 'private sphere' with or without interaction with others, free from State intervention and from excessive unsolicited intervention by other individuals". While the majority of literature and legislature concentrate on "the right to privacy", in another such report (A/HRC/31/64) it has been noted that there is currently no internationally accepted definition of privacy.

Statistical population register: According to the Statistics Division (UNSD) of the Department of Economic and Social Affairs at the United Nations, a statistical population register is a systematized and indexed collection of individual records for every resident (including nationals and foreign citizens) of the country. Where developed and functioning, it represents the backbone of the compilation of official statistics and a master population frame as well for designing and running statistical surveys. Connected on a regular basis and under the provisions of the law with administrative registers (starting with the administrative population register), it should be regularly updated with pertinent information. The legal framework for establishing, maintaining and exploiting the national statistical population register must ensure that it is used solely for compiling aggregate statistics and that it cannot be accessed for any other purposes either within or outside of the national statistical authorities except for approved research.

Record linkage environments: Originally, record linkage involved the matching of records across two administrative data sources in a stand-alone fashion. However, over time it became recognized that as the demand for linked data assets increase,

frequent manual linkages of the same datasets for multiple purposes is inefficient, costly and difficult to manage. Therefore, it is often recommended to build more system-based and ongoing record linkage solutions, or record linkage environments so that linkages can be used for multiple analytical purposes.

Record linkage methods: Record linkage methods are used to identify the same unit in different data sources to be joined together. According to the Statistics Division (UNSD) of the Department of Economic and Social Affairs at the United Nations, such methods may involve:

- **Deterministic method** in which multiple match keys (such as name, sex, date of birth and postcode) are used to link records across the administrative sources. The same set of match keys is produced for each dataset. If the match keys are the same on each source, a link is made, however, the link may not be unique.

- **Probabilistic method** that identifies links between records in two datasets by comparing and quantifying the relative similarity of records and assigning a 'similarity score' – a process that is sometimes referred to as 'fuzzy matching'. This has the benefit that, compared to the deterministic method, it does not require record values to be identical in both records. However, the disadvantage is that some links may be wrong, but this may have little effect on the overall statistical results.

Relevance: An element of data quality that refers to the degree to which statistics meet current and potential users' needs.

Researcher: The person using the anonymized linked data for the purpose of policy analysis, research and monitoring/evaluation. This typically refers to academic researchers from outside of public service.

Statistical infrastructure: The Australian Bureau of Statistics defines statistical infrastructure as tools that support the operation of a statistical system. These tools can help to organise the statistical system, improve efficiency, add value, create new outputs or simply perform tasks within the system. The scope of statistical infrastructure may include the following:

- principles, policies and legislation;
- frames and registers;
- frameworks;
- standards and classifications; and
- analytical tools and systems that are critical to the collection and dissemination of statistical information.

1 Introduction

The central themes promoted by the UN World Data Forum in 2023 include the importance of bringing quality data to decision and policy makers and improving overall data and statistics communication. The forum also promotes efforts to create an enabling environment for the integration and use of different data sources through innovation and synergy across data producers. This is to respond to users' needs, and ensure data and statistics are fully inclusive and address issues relevant to all population groups.

Administrative data related to children and adolescents (as for most administrative data) are collected for the purpose of administering programs and providing services. Administrative data also have statistical utility and are used by statistical agencies in stand-alone statistical programmes or in combination with surveys and census activities. Some countries have developed integrated statistical systems based on administrative data and many are using administrative datasets in combination with other administrative datasets, surveys, or other data to develop sectoral data platforms. Both approaches have proven their effectiveness in supporting strategic policy activities such as policy analysis, research, monitoring, evaluation, programme delivery and reporting on results. Many countries which have developed integrated statistical systems have done so incrementally, linking, integrating and developing data within and across social domains.

The COVID-19 pandemic underscored the need for investment in robust statistical infrastructure and data platforms to produce timely and quality disaggregated statistical information to support decision-making. Many National Statistical Offices (NSOs) were able to produce statistical information to support urgent decisions related to the COVID-19 pandemic (e.g., informing vaccine rollout priority groups, need for emergency response benefits and identifying at-risk populations). Some of these activities were based on quickly leveraging data platforms which lend well to disaggregation given the typical census-level coverage of administrative data sources.

These rapid responses were made possible through years of NSO investment in developing statistical infrastructure and data platforms, increasing technical capabilities and forming partnerships with line departments and researchers. Interestingly, in some cases these data platforms originated as small-scale sectoral data platforms which grew over time through investment. Indeed, as the data

sources are added to a data linkage and integration platform, greater value is added; data synergy is created through increasing comprehensiveness. This enables further insights and answers research questions in ways that would not otherwise be possible.

Many NSOs also developed proactive risk management approaches to ensure the trust of the public in security, privacy protection and data quality. Over time, these NSOs have also put in place governance structures and invested in information technology. For example, Statistics Canada worked with line departments in a crisis management mode to link data from the Canadian Emergency Response Benefit (for workers in need of income support) to other key datasets in 2020. An impressive set of data from this national programme was made available to decisionmakers within a few months. In line with Open Government principles, these datasets were made available to external researchers through the Research Data Center by the fall 2020. Other data informing the activities and results of this program followed, including a platform linked to the census, for a total of six distinct datasets being accessible through the data centres.

Similarly, substantial capacity was achieved in the United Kingdom, enabling significant data linkage initiatives to help manage the pandemic. According to the United Kingdom Office of National Statistics, data linkage enabled rapid insights and ensured evidence-based decision making at a time of emergency. With this, understanding grew of the need for accelerated data sharing within and outside of governments. Stakeholders collaborated on many urgent issues, including data linkage to measure the effects of the pandemic disaggregated by ethnicity.

According to Statistics New Zealand, enabling access to data during the COVID-19 pandemic was crucial for the government's decision-making process. During this time the Integrated Data Team of the NSO upheld accessibility to and security of the data for urgent projects.

Furthermore, Statistics Finland established a COVID-19 situation room in April 2020 to provide key stakeholders with access to information including rich administrative data for research on the effects of the pandemic. Direct identifiers were removed from the data and replaced with pseudo-identifiers for linkage. Using these data, Statistics Finland put together reports that were freely available online. In 2023, a new Data Room pilot will be launched based on this experience.

The development of administrative data linkage capacities in the above countries (which enabled them to respond to urgent needs) was guided by strong leadership which utilized long-term strategic planning coupled with incremental short-term tangible results and substantial investments over the decades. These are activities that take time and sustained leadership in order to leverage more value from the administrative data for evidence-based policy making, improved services and reporting on results for children and adolescents. NSOs closer to the beginning of their administrative data journey should consider the experiences and lessons learned of other NSOs who are now realizing a large return on investment.

All NSOs face high demands for data and are often limited in their capacity to respond. This report aims to provide information that will allow NSOs to accelerate the linkage, integration and development of person-level statistical administrative data for children.

2 Objective

The Children Statistics Group of the Statistical Conference of the Americas determined that the development of administrative data platforms would lower policy planning and evaluation costs, generate evidence more frequently and allow for more complex analyses. The Working Group agreed that this can be achieved by connecting variables from different thematic sectors and by creating profiles over time of a country's inhabitants. Therefore, the Working Group proposed the following objectives for the diagnostic of capacities in terms of developing linked administrative data for statistical purposes related to children.

2.1 General objective

- Improve the quality and use of administrative data for the design of public policies for children and adolescents and for the monitoring of the SDG agenda in the region.

2.2 Specific objectives

- Develop a diagnostic on the state of maturity of the administrative data systems for children in the region to establish the degree of preparation for data linkage and integration in each system.

- Complete diagnostic assessment with participating countries in the region.

- Develop a typology of systems for the development of platforms linking and integrating administrative data and surveys data in the region.

- Develop recommendations and an action plan aimed at preparing systems for linking administrative data and surveys.

2.3 Scope

It is recognized that as more general population administrative data are produced and used for statistical purposes, it is important to ensure that integrated statistical systems of administrative data are invested in, built and maintained in a manner that considers the unique attributes of children's and adolescents' data and that its use is promoted for the greatest impact for children. As a first step, this diagnostic focuses on the demand for linked administrative children's data for statistical purposes with consideration for close links with population-level linked administrative data. Future technical products may be developed and will focus on the contextual, technical and governance considerations which differentiate children's administrative data from other types of administrative data used for statistical purposes.

Data linkage is the process in which records or units from different data sources are joined together to create a new richer data platform or dataset. This may include various types of data such as survey data, administrative data originating from public institutions, and data originating from private firms. Note that this diagnostic focuses on the use of administrative data originating from public institutions, nonetheless, the approach could extend to other sources such as private sector data. Moreover, the report focuses on data linkage, integration and development as a means to develop high quality statistical records. Statistical records are intended for aggregation and analysis in which no action concerning an individual entity is taken. Finally, this report focuses predominately on person-level administrative data, as opposed to businesses or other units of analysis.

A total of 26 member countries in the Latin America and Caribbean (LAC) region were invited to participate in the administrative data readiness diagnostic assessment. Of these, 21 countries participated by providing information relating

to data linkage activities in terms of governance, data issues, information technology, human resources and other enablers such as change management activities and budgets.

The diagnostic aims to help countries accelerate their use of their administrative data for statistical purposes in the medium term, building capacity to shape long-term strategies and future efficient, timely and comprehensive child and adolescent data on a range of social dimensions. This will better support the research on the determinants for children's security and development outcomes related policies and programmes, along with the monitoring of results. This will also benefit projects within the framework of South-South cooperation and the Sustainable Development Goals (SDGs) 2030 agenda[1].

3 Background

For children and adolescents to reach their full potential, it is key to understand the circumstances in which they live, the barriers they face as well as which programmes and policies work for whom and under which conditions. One cannot improve what is not measured, and disaggregated data on children and adolescents by important dimensions such as sex and gender help to uncover how circumstances, barriers and needs may differ by subgroups. As stated in the UNICEF Data for Children Strategy (2017): "...When the right data are in the right hands at the right time, decisions can be better informed, be more equitable, and more likely to protect children's rights...".

This section discusses the statistical use of administrative data for decision-making. It describes key considerations and challenges and provides relevant international examples.

3.1 Why use administrative data

Like survey data, NSOs use administrative data to support statistical operations. Administrative data, which are data originally collected through the routine delivery of a service, are used in many ways in NSOs including (for example) developing

[1] See progress towards SDG targets for 2030 at the following dashboard: SDGs.

linked analytical files, replacing survey variables, creating sample frames, developing indicators and improving other data sources. NSOs also use linked administrative data to develop statistical systems based on registries or to develop key elements of their systems. In all statistical uses of administrative data, the data must go through a transformation process to make it fit-for-use.

Below are some of the benefits of linked administrative data:

1) **New research insights.** Linking administrative data across different sectors (life domains) and over time allows for new insights that would not be possible within a stand-alone dataset. For example, linking early year health, socio-economic and other data to income data throughout adulthood can help illuminate life course patterns.

2) **Efficiency.** Once systems are built and maintained, the use of linked administrative data in statistical programmes can be more efficient and cost-effective than collecting information directly from respondents.

3) **Reduced response burden.** The use of linked administrative data permits the number of questions asked of respondents to be reduced. This reduces survey response burden and saves time for respondents and field enumerators.

4) **Data quality.** In some cases, linked administrative data is higher quality than information coming directly from respondents in surveys. For example, in health data hospital or physician records may be more accurate than self-report information.

5) **Timeliness.** Sometimes administrative data are updated at a greater frequency as compared to survey data. For example, administrative data may be collected on an ongoing or annual basis while the Census of the Population in a country may only occur every five or ten years. Further, statistical production systems which are developed to receive and process data on a repeating basis (not ad hoc) under Memorandums of Understanding or similar agreements realize great efficiencies and stability.

6) **Coverage.** Administrative data sources aim for complete (or census) coverage of the target population, for example, all programme recipients or all physician visits. This census-level coverage allows for comprehensive insights and the ability to disaggregate the data (although it is recognized that challenges with over- and under-coverage must be addressed in data development activities). This has the potential to lead to richer data on children with greater disaggregation. For example, more granular geographic gender-based analysis may be possible. Ultimately, this could support evidence-based decisions to improve the development and the security of disadvantaged groups.

Spotlight: Administrative data and gender statistics

The realities, circumstances, barriers and needs of children and adolescents vary substantially according to gender, that is, according to the expectations, roles, social, cultural and psychological constructs that (in their context) have been associated with their assigned sex at birth. Administrative data presents strategic opportunities for generating statistics on gender-based topics. For example, information on childhood pregnancy, childhood marriage and gender-based violence are reported through administrative records.

3.2 Approaches to linked administrative data and supporting statistical infrastructure

The development of linked administrative data assets can take multiple forms depending on factors such as the availability and types of data as well as the capacity of the NSO in terms of leveraging administrative data. For example, countries with civil registration systems have particular opportunities that other countries may not. Additionally, countries which have invested in infrastructure will be further along.

As mentioned previously in the Section 2: Objective, the Children Statistics Group of the Statistical Conference of the Americas determined that the development of administrative data linkage and integration platforms is the ideal end state for countries, recognizing many benefits of this approach. The Working Group articulated that this end state can be achieved by connecting variables from different thematic sectors and by creating profiles over time of a country's inhabitants.

Integrated statistical systems based on registers

An ideal future state for some NSOs is an integrated statistical system based on statistical registers. Internationally, many statistical systems are moving away from surveys towards an approach based on linked data and the development of registers. In these situations, NSOs use administrative data strictly for statistical purposes under appropriate policy coverage and legislation.

As stated in the 2021 report, "Towards an Integrated Statistical System based on Registers", prepared by the Inter-American Development Bank (IDB), "The Population Register is the most important statistical register. The classification into traditional or register-based systems can be based on the existence of a Statistical Population Register. If the NSO has been able to create a Population Register, it will be relatively easy to create more registers". When an NSO's national production system is fully register-based, registers are used to replace population census activities, in sample survey frames and for register-only statistics.

The United Nations Statistics Division (UNSD) is completing a Handbook on Registers-Based Population and Housing Censuses. This document summarizes some of the processes and actions that NSOs may wish to adopt in order maximize the likelihood of a successful transition to an administrative data-based census and how to resolve the difficulties and challenges in doing so, based on the experience of others.

Administrative data linkage environments and integration platforms

In many countries, data linkage environments and integration platforms that are register-like exist. These are often, but not always, developed and managed within the NSO. Often these platforms differ from stand-alone linked files in that they hold the capacity to link multiple data sources through an intermediary spine. Sometimes these platforms are sector specific (e.g., education) and many combine different subject matter areas (e.g., immigration and health). Additionally, these platforms can be linked to other platforms (e.g., tax information on an individual linked with business information).

A common use of such platforms is analytical studies involving research on a survey cohort or a cohort identified in administrative data. Such platforms may also be used for activities such as coverage and validation studies.

Such environments have often been described as the whole being greater than the parts, where it is not only the number of datasets on the platform, but also the synergy created when a set of databases are linked. This capacity for linkage, where

each dataset in the environment can be linked to another, presents unique opportunities that would not otherwise be possible. The reusability of the linkages creates considerable efficiencies in terms of time and costs. That is, data are linked once, and the linkage keys can be re-extracted multiple times for different projects; moreover, data sources can be updated and new data sources can be added. The longitudinal nature of the data allows for the creation and monitoring of developmental trajectories from birth, through childhood and onwards. The register-based systems above also result in such benefits.

Ad hoc administrative data linkage and integration activities

In some countries administrative data linkage and integration activities happen on an ad hoc basis, linking surveys to administrative data or one administrative data source to another in a stand-alone fashion. These are often but are not always developed and managed within the NSO. A common use of linked files is analytical studies involving research on a survey cohort or a cohort identified in administrative data. Such files may also be used for activities such as coverage and validation studies as well as survey frame development or variable replacement.

3.3 A few international examples

This section highlights international exemplars of administrative data linkage and integration platforms.

Statistics Norway has a long tradition of producing population statistics based on administrative registers and data integration. It has been in the forefront of Civil Registration and Vital Statistics development both nationally and internationally.

Statistics Denmark also has a long tradition of register-based statistics, given its extensive collection of registers. In Denmark, some administrative data sources cover the period of the 1970s to present, holding substantial research potential in life-course analysis, long term outcomes and intergenerational research. Data from other sources can also be linked to data from Statistics Denmark, including a researcher's own data collection or data from other administrative registers. In May 2022, Statistics Denmark oversaw a session on statistical follow-up on the SDGs with the help of non-traditional data at the United Nations Economic Commission for Europe Expert Meeting on Statistics for the SDGs.

Sweden produces its census entirely from administrative data records while Statistics Poland combines data from registries and sample surveys to produce its Census of Population.

In the United Kingdom, the Children in Family Justice Data Share used data from the Ministry of Justice, Department for Education, and the Child and Family Court Advisory and Support Service, amongst others in effort to increase understanding of how decisions in the family court impact on children's educational outcomes and life-chances. The sectoral data platform has been made available on the data share system allowing safe access for many, including members of the Administrative Data Research Network.

In 2013, the Northern Ireland Statistics and Research Agency established the Administrative Data Forum, consisting of representatives from the Northern Ireland government departments, agency staff and senior researchers from universities. Its purpose was to set priorities for work streams that led to the development of a data acquisition strategy with a priority focus on education and health data.

Statistics Finland produces about 160 different sets of statistics with the majority derived from administrative data. The Statistics Act in Finland states that statistics must be compiled primarily by exploiting secondary data, such as from administrative records. Under the Act, Statistics Finland has an obligation to extend the use of the data collected for statistical purposes in scientific studies and statistical surveys on social conditions. Finland also holds a central population register, established in the late 1960s, that comprises all persons who have held a permanent place of residence in the country.

In New Zealand, the Integrated Data Infrastructure is a large research database holding microdata about people and households. It includes information about life events such as education, income, benefits, migration, justice and health. Data originates from surveys, government agencies and non-government organizations. Access to integrated data is granted according to the Five Safes framework which originated in the United Kingdom: safe people, safe projects, safe settings, safe data and safe output. The following video from New Zealand demonstrates how administrative data contribute to improve the wellbeing of children and young people in New Zealand: How integrated data is helping New Zealanders | Stats NZ

In Canada, Statistics Canada performs administrative data linkage and integration largely through the Social Data Linkage Environment (SDLE) to support the design, maintenance, evaluation, research and redesign of ongoing data collection and

methodological studies within the organization. Data platforms such as the Longitudinal Immigration Database and the Post-secondary Information System originate in the SDLE. These linkage and integration activities are also done to provide statistical information in aggregate or anonymized format in support of research studies, the development of policies, service improvements and for reporting on results.

> The recent experience with the Canadian Labour Market Development Agreements is a good example of a cost-effective platform integrating administrative records including adolescents in the labour market. The collaboration of many stakeholders at the federal and provincial levels in Canada supported the production of evidence for the development of strategic policies and programme designs. For details and for other examples of countries leveraging administrative data to support impact evaluations, see: *OECD, June 2022, Assessing Canada's System of Impact Evaluation of Active Labour Market Policies.*

At UNICEF, the Multiple Indicator Cluster Surveys program, known as MICS, was developed in the mid-1990s. Since then, it has become the largest source of statistically sound and internationally comparable data on children and women worldwide (see Home - UNICEF MICS). Under this programme, MICS Link promotes the interaction of MICS with other data systems. This increases the analytical power and potential applications of household survey data by national governments. This initiative was born in response to the increasing demand for evidence for policy-making. It is aimed at contributing to data interoperability and strengthening data use.

3.4 Examples within the Latin America and Caribbean region

Since 2011, the Children Statistics Group of the Statistical Conference of the Americas has focused its efforts on improving the region's capacity to produce statistics on children and adolescents. It was agreed in 2019 that the region's countries should aim to have systems of linked administrative data for children and adolescents.

In a 2021 report, the International Development Bank (IDB) indicated that it continues to contribute to such advances in the region. The document entitled, "Toward and Integrated Statistical System Based on Registers", prepared by Wallgren and Wallgren, provides a useful conceptual and methodological reference for those countries seeking to make further progress in designing, developing and

implementing an integrated register-based statistical production system. For several years, the IDB has been working closely with LAC countries and promoted various initiatives, including training sessions, to:

- Improve the quality and coverage of administrative systems.
- Strengthen NSO capacity to play a central role in the coordination, standardization, exchange and interoperability of registers.
- Promote the creation of integrated and coordinated register systems.
- Set up modern statistical legal frameworks that allow for an adequate flow of data while also safeguarding its confidentiality.

In particular, the IDB reported that Brazil and Mexico have managed to link different administrative registers in the recent past.[2] For example, in Brazil the National Institute of Statistics and Geography has validated the health records on violent deaths (including for children and adolescents) with records from different police forces and from other sources. While using administrative data, the work can be best characterized as a data validation exercise, not as a linkage for the development of a data platform.

The IDB report also highlights the work of Colombia and Costa Rica, which have included an identification number in the Census to facilitate integration with other administrative sources of sociodemographic information. The report also mentioned that pilot Census plans based on administrative records are being carried out in Ecuador and Uruguay. Further, in Chile, since 2018, institutional strategic planning and the implementation of strategic projects that point in this direction have been worked on. Additionally, there is collaboration between some LAC countries for the development of their respective registries, as well as other working groups that aim to obtain greater value from administrative data with the support of the UNSD.

Some NSOs in the LAC region are actively participating in the ongoing work of the Collaborative on the Use of Administrative Data for Statistics, led by the UN Department of Economic and Social Affairs (henceforth the Collaborative). The Collaborative states its objective as follows: "Members of this initiative work together in a coherent and cross-cutting manner to address both urgent and longer-term needs around the access and use of administrative data for statistical

[2] It is recognized that these two countries are at different stages of maturity as assessed by this diagnostic.

purposes, building on advances made in various sectors and by different partners. The Collaborative is a platform to share resources, tools, best practices, and experiences and contributes to raise awareness among all members of national statistical systems about the benefits of sharing and combining administrative sources to enhance the quality, timeliness, coverage, and level of disaggregation of statistical data."

The Collaborative has developed a self-assessment tool as well as an inventory of resources to make materials on the use of administrative data for statistical purposes more readily available and easy to find. The inventory includes case studies from specific countries, resources and guidance on data quality, data linkage, privacy and security, governance and dissemination. For example, the work of the NSO in Chile to estimate the number of foreign residents, including children and adolescents, was included. Also available is the conceptual and methodological framework from Uruguay that supports its Integrated System of Statistical Records and Surveys. The work of Colombia on its statistical population register is also included in the inventory of the Collaborative (*see* *https://unstats.un.org/capacity-development/admin-data/#*).

Some NSOs are also involved in work to improve administrative data methods within the framework of the Economic Commission for Latin America and the Caribbean (ECLAC) group "Tools for the evaluation of the quality of administrative records". Some activities from the UN's South-South Cooperation, a broad framework for collaboration and exchange among countries of the South in the political, economic, social, cultural, environmental and technical domains, also relate to a degree. Finally, individual countries are, of course, making their own efforts both within and sometimes outside of the NSOs.

3.5 Privacy considerations, public trust, and data access

In most countries, public expectations are high in terms of decision-making in government being based on robust evidence. It is generally expected that efforts are made to inform on the outcomes or results achieved by government investments. When the data and the methods allow, cost-benefit analysis, return on investments calculations and benchmarking to other interventions can be produced. This information can lead to improved evidence-based decisions and influence the allocation of funding to what works best. However, in recent years

there has been rising concern about data harms and the declining trust in public institutions and experts. For every institution, data linkage requires careful risk management to gain and maintain public trust.

There are two imperatives when considering the use of linked administrative data in this context: (1) the use of linked administrative data by NSOs is essential for public systems to continually improve, drive equitable outcomes and be sustainable, and (2) administrative data record linkage is privacy invasive by nature. Therefore, clear frameworks, processes, governance, oversight and communication strategies are required when undertaking administrative data platform and record linkage activities. Countries also need to consider the social license or public acceptability of such activities.

For linked administrative data to be useful it must be accessed and used by NSOs, ministries and other data users that can create data impact while simultaneously being kept secure and upholding public trust. To accomplish this in the Canadian context, for example, Statistics Canada supports a large network of Research Data Centers for dissemination to approved individuals (see short video about the network at: About the Canadian Research Data Centre Network - Canadian Research Data Centre Network) The governance for the development of administrative data platforms and for research planning includes periodic senior-level exchanges with many government departments and organizations at the federal, provincial and community levels.

3.6 Challenges in the use of administrative data

The development of administrative data platforms and record linkage activities can provide better insight to inform policy development, service improvements and reporting on results. Therefore, it can greatly increase the utility of data and be integral to government statistical systems. However, this comes with challenges, some of which are outlined below according to the four themes used in the diagnostic.

Scope (demand) for data platforms

The first challenge is to ensure data relevancy. Is there a statistical need clearly expressed for a new data platform? Is there an information need, client or data user? The specific need for better data is the driving factor that will help mobilize support

and the necessary resources. Oftentimes this need is clear within an NSO in terms of addressing declining survey response rates and alleviating response burden, reducing costs, disaggregating data and improving data quality, but this need may not be clear to others, for example, within line ministries.

Moreover, the development of relevant data platforms requires NSOs and data providers across various parts of government, sectors and communities to work together, and for the respective responsibilities to be clearly defined. Individuals are at the heart of data sharing and its strategic use for influence. The people engaged in designing, collecting, providing and interpreting data are crucial factors in enabling data use for policy influence. Breakdowns in communication can leave data untapped in addressing public challenges. As stated by the United Nations Economic Commission for Europe, the most effective way of promoting the activities and outputs of an NSO may be to ensure greater involvement of target users at the planning stage.

In the 2021 Anders Wallgren and Britt Wallgren publication prepared for the IDB, "Toward an Integrated Statistical System Based on Registers)", the authors stress the importance of deep and ongoing relations between the data linkage authority (the NSO) and the data custodians (the administrative authorities) for the development of linked data platforms for statistical use. The point is made as follows:

> "...For the statistical office, the contacts with administrative authorities are necessary for many reasons. The statistical office needs not only microdata but also metadata with definitions of all administrative variables. The process that generates the administrative registers must be understood—how has the administrative object set been generated? .... Contacts with the statistical office are also important for the administrative authorities. The authorities will gain new quality information. New kinds of comparisons with other sources can be made with the statistical register system. Lack of statistical quality will also indicate lack of administrative quality. Under-coverage is not only a statistical problem, but also an administrative problem. Duplicates or incorrect residential addresses are also administrative problems..."

The experience of Northern Ireland with its collaborative approach for the development of a Data Acquisition Strategy is inspiring. Its purpose was to set priorities for work streams based on the requirements of academic and government researchers, balanced against policy needs and to identify relevant administrative datasets from across government. Once clear priorities for a work stream were

established, it looked to strategies to ensure the capacity would be there to perform the work using administrative data records.

Governance

On the issue of public trust and privacy protection, the linkage of administrative data demands robust data safeguarding, transparency and clear communication to maintain public trust. A survey conducted in 2017 by the Data Integration Project (for a high-level group for the modernization of official statistics who sponsored projects on data integration; [see details at Barriers - Barriers - UNECE Statswiki]), found that public acceptance and trust issues caused more significant barriers to data integration compared to issues such as legal challenges, methodologies, skills and budget. A good risk management strategy will address these risks and will include activities to nurture trust from the public.

Another challenge for NSOs is whether the legal and administrative structures are in place to govern or to control the data linkage and integration activities. This includes access to administrative data as well as defining data security roles and responsibilities including data owners, custodians and users.

There are many important technical components which underpin this public trust and legal compliance. This includes, for example, secure information-exchange mechanisms and methods to protect the use of data (i.e., anonymization, identity protection and encryption).

Data issues

Like survey data, linked administrative data carry certain data quality issues such as conceptual differences, capture errors and poor linkage rates. It is therefore important to understand dimensions such as provenance, lineage and metadata for the data being used. It is also important that an NSO carefully examines the relevant quality criteria: accuracy, completeness, consistency and validation.

One important consideration in the use of all data, including linked administrative data, is bias. As administrative data are by definition captured in systems constructed by institutions, the data may hold bias which is difficult to measure. For example, children in need of a social service, but unable to access it will not be included in the administrative data for that system. One benefit of a register-based system or data platform is that data confrontation and validation studies can be carried out to assess and, in some cases, correct identified bias. Additionally, issues of bias specific to the record linkage process must be understood and addressed.

Spotlight: Administrative data and gender statistics

One strength of administrative data is that the many sources include information on sex or gender, allowing for important disaggregation opportunities. This aligns with the Guidelines for Gender Mainstreaming in the Working Groups of the Statistical Conferences of the Americas where it is stated that mainstreaming the gender perspective in statistical production requires that data are presented in disaggregated form, with sex as the main and general classification.

Observing this guideline in the use of linked administrative data in children and adolescents requires careful consideration in the data development process. Administrative data may sometimes be considered *found data* in that it is not possible to design or influence the data collection. Therefore, sex and gender information appearing in administrative data may not align with the constructs of sex (refers to "sex assigned at birth," which is the designation made to a newborn based on visual assessment of physical characteristics, primarily external genitalia) and gender (refers to the socially constructed differences in attributes and opportunities associated with being male or female and the social interactions and relationships between women and men, or is used to refer to "gender identity" which refers to how a person feels, perceives and identifies in terms of their gender). For example, an administrative data set may contain both sex and gender information (or just one of the two), a variable that conflates the two concepts, and possibly proxy responses that differ from self-reporting. Moreover, when integrating data from different data sources, the combining of sex and gender information from multiple sources needs to be considered.

The quality of data and of associated metadata is often an ongoing challenge for both the data providers and for the NSOs. NSOs are well placed with their expertise in this area to help improve quality with the support of their data providers. NSOs are also well-oriented to understand the limitations of administrative data, which include, for example, the absence of important social concepts which may be measured through self-report only.

Information technology, human resources and other issues

Building and hosting linked administrative data platforms requires a large volume of data and is computationally intense. Information technology systems are required to enable storing, retrieving and securely sharing data. Adequate technological capabilities may include server capacity, computers and software, secure data storage capacity and location, central repository acting as a common and controlled source, and data extraction processes.

A final key challenge is having the right human resources, skills and knowledge of new methods.

Taken together, moving towards integrated systems of administrative data on children requires a strong approach to change management. Change management must consider governance, NSO policies, organisational culture, current production processes and all enablers mentioned above.

4 Methodology

This section discusses the methodological approach for the administrative data readiness diagnostic assessment. Despite the wide range of issues considered, the approach promotes the comparability of results across the different types of statistical systems.

4.1 The approach

The diagnostic is based on qualitative research methods with four lines of evidence (written questionnaire, semi-structured interview, document review and external expert consultation) to help ensure the validity of results by triangulation of facts. The information was collected between July and October of 2022. Three caveats should be kept in mind:

1. NSO representatives were asked to answer questions to the best of their knowledge about the situation in their respective organization. Given the wide range of issues covered, some individuals may not have had all up-to-date information on their NSO.

2. The situation of some NSOs as reported may have evolved since the time at which the information was collected.

3. Finally, data linkage and platform development related work may have been done outside of the NSO in some countries, and NSO officials may not be aware.

Written questionnaire: A questionnaire was used as the first tool of engagement with NSOs (see Annex 2). This ensured comparable basic and reliable information for the assessment process of each system. The draft questionnaire was shared

with outside experts and stakeholders for their review and comments. These were from UNICEF, the Economic Commission of Latin America and the Caribbean (ECLAC), Statistics Canada, and Employment and Social Development Canada. Once comments were addressed, the questionnaire was discussed and validated by the diagnostic working group and finalized.

The 49 questions used can be grouped under the following thematic areas: scope (demand) for data platforms, governance, data issues, information technology, human resources and other issues:

Scope (demand) for data platforms: The first set of questions on the scope sought to assess the extent to which an NSO has generally engaged stakeholders and users of specific needs for administrative data linkage, and also specific to elements relating to children and adolescents. These needs could relate to gaps for SDG monitoring, or different stakeholder needs, for example, in terms of policy analysis, research, or programme evaluation. The United Nations Fundamental Principles of Official Statistics suggest that statistical agencies are advised to organise regular dialogues with stakeholders and users to understand their needs and the purpose statistics should serve in keeping with the fit-for-purpose paradigm. It is important for the NSO to develop data in line with specific needs.

Governance: The governance questions sought to assess the readiness of legal and administrative structures to govern and control the data-linkage and platform-development activities. This included legal or regulatory conditions for NSOs to access administrative data, use of agreements with data providers, authorities and processes used for data collection, privacy protection including protocols for anonymization, and secured access. This is important to ensure clear responsibilities and accountabilities for the safe and secure linkage activities. It is key to develop and to maintain public trust in the NSO performing these activities.

Data issues: These questions sought to determine the readiness of the NSO to receive, process, link, integrate, develop and safely disseminate statistical administrative data, both generally and specific to elements relating to children and adolescents. These questions also touched on the usage of administrative data records related to population coverage, common structures for linking, availability of unique personal and geographic identifiers, breakdown by socio-economic and demographic characteristics

(including sex and gender), encryption methods for data sharing, data, and metadata quality control issues. It is important for an NSO to address these technical issues and to develop these capacities for high-quality data and for secure data linkage.

Information technology, human resources, and other issues: These questions sought to determine the readiness of systems in terms of structures, software, and computers for storing, central repository capacity acting as a common and controlled source, retrieving, and securely sharing information with seamless extraction processes. The other issues include human resources, change management, funding/budgets, communication activities and support needed from outside the NSO. NSOs need to plan for these diverse and complementary elements to enable data linkage and platform development projects.

To begin the assessment, country leads from the NSOs (*see participants in Annex 1*) were invited to respond to the written questionnaire (*see in Annex 2*). They were instructed to consult as needed within and outside of the NSO as necessary to better understand the overall situation in their country. They were also asked to provide comments in writing or any documents that could help inform the assessment.

This engagement of NSO officials limited the burden on them and others that supported them. Out of 26 NSOs who were asked to participate, 21 did so. For some of the others who have not responded, a brief discussion or email exchanges helped to understand their positions.

Semi-structured interviews: Following initial engagement, the written questionnaire was then used to develop semi-structured interviews. For the countries who participated, the in-depth interviews were done virtually with officials with first-hand knowledge. The discussions included collaborators that the country leads wished to convene as additional informants to assist them, as they saw fit.

The open-ended questions enabled discussions of important and sometimes unanticipated issues. Therefore, the interviews more closely resembled a conversation rather than a highly structured interview. This approach helped to clarify and elaborate further on the information already shared through the written questionnaire and documents. This format also allowed special attention to be paid to plans for data disaggregation by priority dimensions such as sex and gender.

Participants were asked to agree to video, transcript and audio recording. Confidentiality was established on the basis that the information provided during the diagnostic process would not be attributed to specific individuals but to institutions (e.g., the NSO, the Ministry of x) or by naming the country.

Document Review: Participating countries were asked to provide relevant documentation, which along with others are listed in Annex 3. The topics typically related to:

- NSO planning documents or strategic plans including plans or projects related to administrative data.
- Legal frameworks governing NSOs.
- Governance issues for statistical systems.
- Information on statistical population registers or census of populations.
- Data quality and other technical considerations.

External experts: External experts provided additional information and contributed to information validation.

4.2 Analysis by themes

The information was gathered from the four lines of evidence (written questionnaire, semi-structured interview, document review and external expert consultation). An intelligent verbatim approach allowing some flexibility in the grouping and reporting of issues was used to record the information by themes. For each of the 21 NSOs who responded, the information collected was structured by the thematic areas for analysis: (1) Scope (demand) for data platforms, (2) Governance, (3) Data issues, and (4) Information technology, human resources, and other issues. Where possible, this information was categorized by strengths, weaknesses, opportunities, and threats, often referred to as a SWOT analysis.

5 Typology of systems maturity

5.1 Typologies

Table 1 below displays the results of the linked administrative data platform readiness diagnostic. It includes the overall readiness organized across the four typologies: Implementing, Enabling, Initiating, and Contemplating as well as level of readiness across the four themes: (1) Scope (demand) for data platforms, (2) Governance, (3) Data issues, and (4) Information Technology, human resources and other issues. Table 1 includes the statistical systems in order of descending maturity for the 21 countries out of 26 invited who participated in the diagnostic assessment. Five NSOs were invited but did not respond: Barbados, Colombia, Ecuador, Guyana and Montserrat.

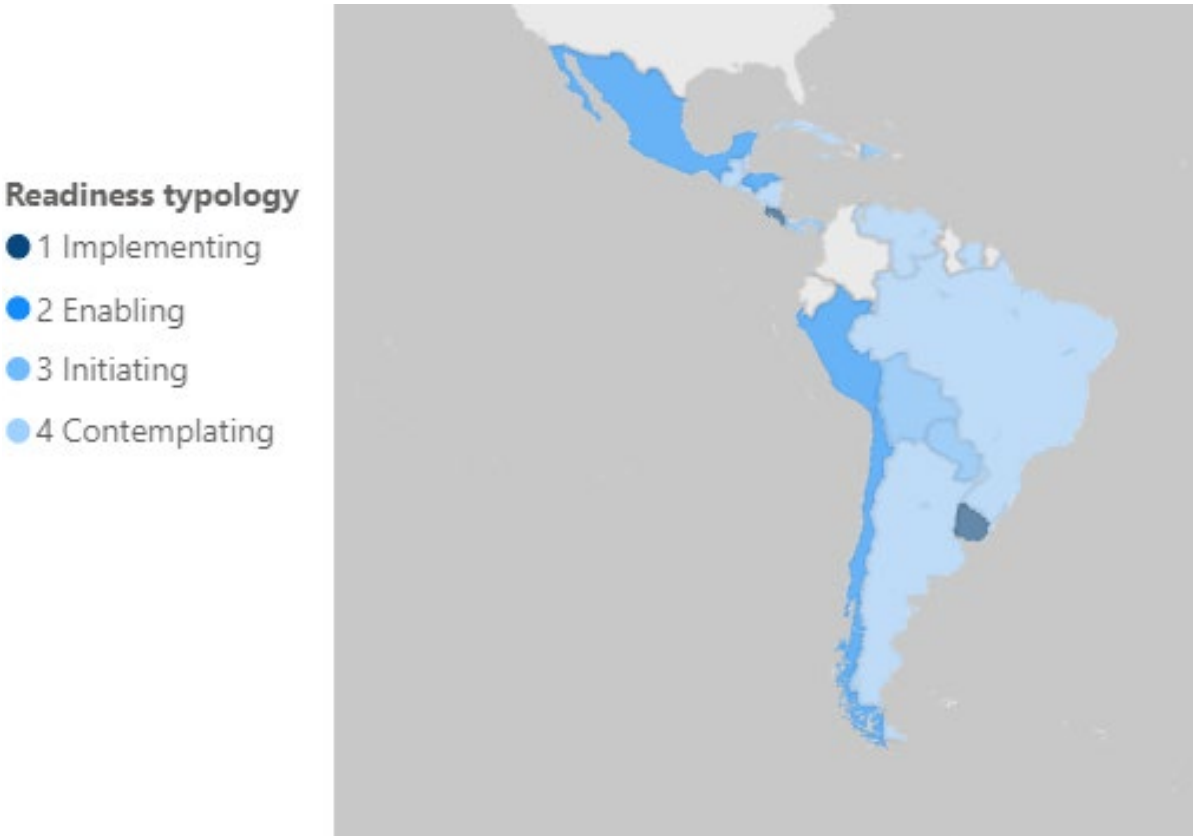
5.2 Table 1: Maturity levels by country

Country	Scope	Governance	Data	IT/other
Type 1: Implementing				
Uruguay				
Costa Rica				
Type 2: Enabling				
Chile				
Mexico				
Peru				
Honduras				
Type 3: Initiating				
Bolivia				
Panama				
Dominican Republic				
Paraguay				
Type 4: Contemplating				
Cuba				

Venezuela				
Argentina				
Brazil				
Guatemala				
Jamaica				
Belize				
Suriname				
Saint Lucia				
Nicaragua				
El Salvador				
Legend:				
High maturity	Moderate maturity	Low maturity		

Map 1: Typology of systems found in the region

The definitions and analysis for each of the four types found is presented below.



5.3 Table 2: Type 1 Implementing

The NSOs of Uruguay and Costa Rica are already working with partners to link administrative data for statistical purposes. They are fixing a few remaining issues to their systems as they develop their data linkage projects.
Demand for data platforms (scope)
<u>Strengths</u> The NSOs have a workplan for the statistical use of administrative data. Activities may include preparing vital statistics information for public release or for the validation or improvement of other existing data. These NSOs are aware that administrative data are sometimes used to provide evidence for decisions within other areas of government. The NSOs are actively promoting their administrative data agenda to continue to expand their integrated systems of statistical records which support many programme and policy areas. Both countries are developing a statistical population register and have started to develop a specific platform as a pilot project in collaboration with line departments of interest. One case study of best practices is from the NSO of Uruguay. It worked with the many ministries to integrate data in its Integrated System of Statistical Records and Surveys, which currently includes 400 different datasets from data provider institutions. For example, consultations took place with the Ministry of Education in Uruguay to explore interest in linking health and education-related data for policy analysis. As part of these consultations, discussions with many other ministries about their specific needs transpired. Through these, it became clear that there was interest in better understanding several strategic policy issues, including: • The determinant and benefits of high-school graduation in terms of labour-market outcomes. • More in-depth information on living conditions of children living in poor households: How many days do these children attend school? Do they benefit from digital education programmes? Do they access medical services when needed? Are some of their rights not respected?   ○ Information on youth and criminal activities: How to reduce the risk of recidivism amongst youth who committed crimes. What is their trajectory once they leave youth centres? What are the determinants for these youth to commit crimes; who is at risk of recidivism?

The NSOs have considered the need for further disaggregation by sub-regions or by other socioeconomic groups, or for more frequent data collection. For example, Costa Rica had developed multidimensional indicators of poverty at the sub-regional level.

Weaknesses

In Uruguay and Costa Rica, current workplans for the statistical use of administrative data do not include specific elements for children and adolescents. However, in Costa Rica there are plans for a proposed National Data Collection System specific for children and adolescents for implementation in 2023.

The NSOs reported that the collaboration of some ministries and agencies is sometimes limited when they are asked to provide their administrative data.

Despite the broad use of administrative data by these NSOs, the engagement of data providers to determine data linkage needs has been done on an ad hoc basis to date.

Opportunities

The NSOs are aware that there are data gaps for monitoring the SDG indicators for children and adolescents that could be addressed by linking administrative data and surveys. They are also aware of a research agenda related to children and adolescents that would benefit from linking administrative data and surveys.

The NSOs are of the view that a related research agenda from a stakeholder would help to advance their work more strategically. They think that a data linkage project could inform the results of government programmes for children and adolescents. Some line departments are interested in discussing their needs with the NSOs.

The NSOs think that generating a network with line departments would help to develop data in support of specific agendas such as for policy analysis, research, and monitoring/evaluation. The NSOs think that administrative data could be used to conduct public policy impact assessments.

The NSOs perceive that data linkage could leverage more value from administrative data to inform results from government programmes for children and adolescents. For example, it could be for programmes in one or more areas

to help with the targeting of services and benefits or to determine if these programmes are efficient and meeting their objectives.

Threat

Some key ministries and agencies are not engaging with their NSO to discuss their needs for platforms linking and integrating administrative data. This can lead to missed opportunities, duplication of efforts and limit the capacity of the NSOs to make a case for additional funding.

Governance

Strengths

There is a national statistics law that grants access to administrative data to these NSOs. The law governing their statistical activities does not conflict with other national laws.

All the NSOs use collaboration agreements in their interactions with data providers. These include detailed definitions as well as the establishment of specific technical commitments.

The NSOs have adequate processes for the collection of administrative data related to children and adolescents, the assessment of the risks posed by data link activities, data processing, secure storage and access.

One success story to note comes from Costa Rica where the NSO has developed a proposed National Data Collection System for children and adolescents slated for implementation in 2023. This required substantial efforts for the drafting of many detailed agreements to secure the necessary data from ministries in country.

Weaknesses

Often there is resistance from data providers to share necessary data.

The NSOs currently do not have sufficient formal governance structures surrounding data protection, management and use. For example, privacy impact assessments, data ethics frameworks and review, and data user risk assessments may be lacking.

The NSOs do not have a protocol for accessing and using administrative data platforms for staff of external organizations (for example, in government agencies

and departments, universities or other research groups), to enable policy analysis, research, monitoring and evaluation.

The NSOs anticipate other challenges relating to the governance of data linkage projects. This may include, for example, advancing in inter-institutional understanding and agreements which will need to address aspects of database structuring, lack of metadata, managing large amount of data, as well as the standardization of variables between various administrative data systems.

Opportunities

The NSOs are recognized as strong and trusted data stewards. This asset can be used as an opportunity for the expanded collection and use of administrative data.

The NSOs are working to improve the collection and dissemination of administrative data related to children and adolescents.

The NSOs are planning to implement or already have measures in place for the protection of data privacy and security, for example, protocols for anonymization.

These NSOs will have to ensure the necessary support at the higher levels of the ministries or departments involved. This includes, for example, the signing of new agreements or memorandums of understanding for the transfer and use of data for linkage. Although a necessary condition, this is also an opportunity to ensure leadership and support from the top of the NSO.

Threat

There exists a degree of resistance from some line departments to share administrative data. This requires substantial time and effort from NSOs, including for the development of detailed memorandums of understanding.

Data

Strengths

The NSOs currently receive administrative data related to their country's population. The datasets have common geographic identifiers and include birth records.

One NSO already has a large system of interrelated elements (administrative data and some sample surveys) functioning as a whole. It is simultaneously a conceptual system (concepts, definitions, metadata, methodology), management

system (processes, administration) and a statistical information system (Statistical Data Warehouse).

Microdata is currently being exchanged, however, some limitations on the transfer of unique identifier information exist.

The NSOs apply an encryption method for sensitive information.

Weaknesses

NSOs indicated that data providers do not have or do not transfer metadata or adequate documentation from their administrative data sources, including data dictionaries, metadata files and others.

NSOs anticipate other data quality challenges such as: advancing in inter-institutional understanding and agreements (including at the municipal level), lack of consistency of definitions between different datasets, the implementation of data quality tests, outdated information, and fields with missing or erroneous data.

Opportunities

NSOs indicated that common data structures are generally sufficient to allow linking of administrative data records.

NSOs have an internal centralized system that allows the receipt of administrative data records.

NSOs are implementing or deepening their process for tracking and regularly updating administrative and survey data records over time.

Threat

Possible lack of public trust that data platforms integrating administrative data will be secure and will protect privacy of personal information. Public trust in the integrity of data linkage activities is considered a risk. NSOs recognized the need for careful risk management related to the security, privacy and confidentiality of administrative data.

Information technology, human resources and other issues
Strengths The NSOs have the necessary technological elements to implement data linkage activities, for example: server capacity, computers and software. They have also considered where the new data will be hosted. A central repository for administrative data is implemented in the NSOs. It takes the form of a data warehouse for data from many sources, data marts and data lakes. A common and controlled source ensures that everyone has access to consistent, up-to-date, and non-redundant information. The NSOs have adequate storage capacity. One of the NSOs has adequate processes to execute data extraction and to provide technical support to allow access to new data platforms. Weaknesses The NSOs do not have the necessary human resources to proceed with the implementation of data linkage projects including adequate skills and knowledge, and data capabilities (data architects, technical support, analysts). Other anticipated challenges include managing a large volume and variety of information, as well as implementing technological infrastructure that allows storing for processing, linking and integrating data that is growing over time. Opportunities The NSOs have adequate processes to execute data extraction and provide technical support to allow access to new data platforms. The NSO of Uruguay has gained valuable insights on providing secure access and the protection of privacy from a hackathon that it held for external participants to use administrative data in an innovative way. This activity provided some lessons learned on the management of the datasets, including insights on secure access and the protection of privacy. The NSOs would consider implementing capacity-building activities in conjunction with other official statistical organizations. They would consider some change management activities, for example, capacity building and

communication for awareness. They see change management activities as a necessary investment in support of data linkage activities.

Threat

The NSOs identify not obtaining the necessary funding as a potential concern. While NSOs have the required technological elements to implement data linkage activities currently, these quickly become expensive in terms of storage and computation costs.

5.4 Table 3: Type 2 Enabling

The NSOs of Chile, Mexico, Peru and Honduras have the capacity to engage data providers to identify needs for platforms integrating administrative data related to children and adolescents. However, this is either not a current priority, or some systemic or foundational elements remain to be addressed before they can begin development of data linkage and integration platforms.

Demand for data platforms (scope)

Strengths

The NSOs have a workplan for the statistical use of administrative data. For example, the activities may include preparing vital statistics for public release or validating other existing data, and to improving the coverage of existing datasets. One of the NSOs has a plan including elements for children and adolescents with identified data sources. One NSO is also initiating planning for a statistical population register.

In these NSOs, administrative data is used to validate and improve the quality and the coverage of existing datasets.

These NSOs are aware that administrative data are sometimes used to provide evidence for decisions within other state areas.

With the exception of one country, all have considered linking administrative data sources and surveys to produce data platforms. Most NSOs have considered which sectors might be of interest.

Weaknesses

There are limited or ad hoc exchanges between the NSOs and ministries on the need for data linkage and integration platforms.

Most of these NSOs do not know exactly to what extent statistical indicators with geographical or socio-economic disaggregation that they produced have been used to meet the requirements of measuring the SDGs.

Opportunities

The NSOs are aware that there are data gaps for monitoring the SDG indicators for children and adolescents that could be addressed by linking some administrative data sources and surveys.

They are aware of research agendas related to children and adolescents that would benefit from linking some administrative data sources and surveys. The NSOs are of the view that a related research agenda from a stakeholder would help to advance their work more strategically.

Some line departments are interested in discussing their needs with the NSOs. For example, one NSO has consulted many ministries and agencies on strategic questions that could potentially be clarified with platforms integrating administrative data. Below are some of the strategic information needs that were noted in that NSO:

-Improving the interoperability of data from specific institutions such as the Ministry of Education and Ministry of Women. In this case, it is understood that this would be for operational purposes.

-Understanding the impacts of a cash-transfer programme on the education pathways of beneficiaries.

-Improving social programmes' coverage (at targeting of services) with information on movement of migrants, including trafficking of children and adolescents.

-Improving the counts of children at various stages in the protection system.

The NSOs think that data linkage could inform the results of government programmes for children and adolescents, and that generating a network with line departments would help to develop data in support of specific agendas including for policy analysis, research, monitoring and evaluation. These NSOs think that administrative data could be used to conduct public policy impact assessments.

Threat

There is often a lack of interest from data providers to engage in discussing their needs. Some are satisfied by the performance of existing surveys.

Governance

Strengths

There is a national statistical law that grants access to administrative data to the NSOs. The law governing their statistical activities does not conflict with other laws of regulations except for one country, where it conflicts with sectoral regulations. This limitation could be addressed in a new law that could be expected in 2023-24. The NSO in this country was nevertheless able to negotiate a detailed memorandum of understanding to enable certain data sharing for data linkage.

The NSOs use collaboration agreements in their interactions with data providers. These include detailed definitions and the establishment of specific technical commitments.

The NSOs have adequate processes for the collection of administrative data related to children and adolescents, the assessment of the risks posed by data linkage activities, data processing, secure storage and access.

In some cases, the NSOs have a protocol for accessing and using administrative data platforms for staff of external organizations, for example, in government agencies and departments, and universities or other research groups, to enable policy analysis, research, monitoring and evaluation.

Weaknesses

While risk assessments are conducted in these NSOs, the majority currently do not have formalized approaches to privacy impact assessments, a data ethics framework, or a user accreditation process for the usage of linked data.

The NSOs anticipate other challenges in the governance of data linkage projects. For example, advancing inter-institutional understandings and time-consuming negotiations of agreements for data sharing. One NSO mentioned that access to data would be difficult at the municipal level.

Opportunities

The NSOs are currently working to improve the collection and dissemination of some administrative data related to the population of children and adolescents in the near future. Some are aligning the dissemination efforts with Open Government Partnership principles.

For the implementation of interconnected platforms, the NSOs are planning to implement or have additional measures in place for the protection of data privacy (e.g., protocols for anonymization).

These NSOs will have to ensure the necessary support at the higher levels of the ministries involved. This includes, for example, the signing of new agreements or memorandums of understanding for the transfer and use of data for linking. Although a necessary condition, this is an opportunity to ensure leadership and support from the top of the NSO.

Threat

All NSOs reported a level of resistance in their countries from data providers to provide necessary data. In one instance, the law governing statistical activities is often misinterpreted by ministries. This requires substantial time and effort from NSOs for the development of detailed memorandums of understanding.

Data

Strengths

The NSOs currently receive administrative data related to the population, but one indicated that it does not receive the microdata. The datasets have common geographic identifiers and include birth records. Some of the data are used to support the activities related to the SDGs.

These NSOs have a unique personal identifier in their countries for the administrative data of interest, except for one NSO who made efforts but still needs to proceed with the implementation. This NSO has been working closely with its UNICEF Country Office since 2019 on related issues.

Microdata on people are currently exchanged, except for with one NSO. All NSOs except one have an internal centralized system that allows the receipt of administrative data records.

A best practice to note from the NSO of Peru is the development of a comprehensive description of metadata for many administrative data sources in the country. This detailed compendium is available to the public.

Weaknesses

Not all NSOs currently apply an encryption method for sensitive information.

All NSOs but one indicated that data providers do not have or do not transfer metadata or adequate documentation from their administrative data sources, including data dictionaries, metadata files and others.

Some of these NSOs do not have a process for tracking and regularly updating administrative and survey data records over time. In some NSOs this is currently being worked on.

These NSOs anticipate other data quality challenges such as the implementation of data quality tests and complex activities to manage.

Opportunities

Most NSOs indicated that common data structures are sufficient to allow linking of administrative data records.

The NSOs all have an internal centralized system that allows the receipt of administrative data records.

Threat

Possible lack of public trust that data platforms will be secure and will protect privacy of personal information. All NSOs consider public trust in the integrity of data linkage activities as a risk. They all recognized the need for careful risk management related to the security, privacy and confidentiality of administrative data.

Information technology, human resources, and other issues

Strengths

The NSOs have the necessary technological elements to implement at least smaller scale data linkage activities, for example, server capacity, computers or software.

They all have considered where new datasets will be hosted. A central repository for administrative data is implemented in two NSOs, and one is developing such capacity. This takes the forms of a data lake, data warehouse, and data mart.

A common and controlled source ensures that data users have access to consistent, up to date and non-redundant information. Some of these NSOs have adequate processes to execute data extraction and to provide technical support to allow access to new data platforms.

Weaknesses

Some of the NSOs do not have adequate data storage capacity or processing power.

The NSOs consider that additional support will be needed to respond to the new demands that are expected to arise from the new data platforms. This may include training on data processing, working on data infrastructure, navigating cloud infrastructure and using the administrative data warehouse. One NSO would welcome help from outside the organisation, such as funding for research.

Most of these NSOs do not have the necessary human resources to proceed with the implementation of data linkage projects including adequate skills and knowledge, and data capabilities (data architects, technical support, analysts).

Other challenges included having to manage a large volume and variety of information, as well as implementing technological infrastructure that allows storing, processing and integrating data that is growing over time.

Opportunities

Some of the NSOs have adequate processes to execute data extraction and provide technical support to allow access to new data platforms.

Threat

One NSO mentioned possible funding constraints.

5.5 Table 4: Type 3 Initiating

The NSOs of Bolivia, Panama, the Dominican Republic and Paraguay do not yet plan to engage data providers on the need for data platforms integrating administrative data. While the NSOs are interested in leveraging more value from administrative data in their country, they are addressing many systemic or foundational elements first.
Demand for data platforms (scope)
<u>Strengths</u> The NSOs have a workplan for the statistical use of administrative data. For example, activities focus on preparing vital statistics for public release or validating other existing data in addition to improving the coverage of existing datasets. Two of the NSOs have a plan including elements for children and adolescents with data sources identified. In all NSOs, administrative data are used to validate and improve the quality and coverage of existing datasets. These NSOs are aware that administrative data are sometimes used to provide evidence for decisions within other areas of government. They have considered linking some administrative data sources and surveys to produce data platforms and considered which sectors might be of interest for their country, except for one NSO which expressed hesitancy. <u>Weaknesses</u> Plans for two NSOs do not currently include specific elements for children and adolescents. These NSOs had limited exchanges on the needs for data linkage from ministries and agencies. <u>Opportunities</u> The NSOs are aware that there are data gaps for monitoring the SDG indicators for children and adolescents that could be addressed by linking administrative data sources and surveys.

All but one of the NSOs are aware of a research agenda related to children and adolescents that would benefit from linking some administrative data sources and surveys. The NSOs are of the view that a related research agenda from a stakeholder would help to advance their work more strategically. Some line departments are interested in discussing their needs with the NSOs.

The NSOs perceive that data linkage could leverage more value from administrative data to inform results from government programmes for children and adolescents. For example, this could be for programmes in one or more areas, to help with the targeting of services and benefits or to determine if these programmes are efficient and meeting their objectives. Some have noted the potential for impact analysis.

The NSOs think that generating a network with line departments would help to develop data in support of specific government agendas such as policy analysis, research and evaluation. In particular, the NSOs think that administrative data could be used to conduct public policy impact assessments. One NSO indicated that result-based budgeting was being implemented in the country. This will likely create more demand for platforms integrating administrative data.

Threat

An anticipated lack of interest from data providers to engage in discussing their needs.

Governance

Strengths

There is a national statistical law that grants access to administrative data to the NSOs. For two NSOs, the law governing their statistical activities does not conflict with other national laws or regulations, but it does for the other NSOs.

All the NSOs use collaboration agreements in their interactions with data providers. These include detailed definitions as well as the establishment of specific technical commitments.

The NSOs have adequate processes for the collection of administrative data related to the population of children and adolescents, the assessment of the risks posed by data linkage activities, data processing, secure storage and access.

Weaknesses

Often there is resistance from data providers to provide necessary data. In one instance, the law governing statistical activities conflicts with other national laws or sectoral regulations.

While risk assessments are conducted, the NSOs currently do not have formal governance structures surrounding data protection, management and use. For example, privacy impact assessments, data ethics frameworks and review, and data user risk assessments may be lacking.

All NSOs except one anticipate other challenges in the governance of data linkage projects, for example, monitoring of complex data linkage activities.

Opportunities

The NSOs are currently working to improve the collection and dissemination of some administrative data related to the population of children and adolescents. Two NSOs underlined that they are aligning the dissemination efforts with Open Government Partnership principles.

The NSOs are planning to implement or have measures in place for the protection of data privacy, for example, protocols for anonymization.

These NSOs will have to ensure the necessary support at the higher levels of the ministries involved. This includes, for example, the signing of new agreements or memorandums of understanding for the transfer and use of data for linking. Although seen as a necessary condition, this is an opportunity to ensure leadership and support from the top of the NSO.

Threat

There is resistance from some line departments to share their administrative data. This requires time and effort from NSOs, including for the development of detailed memorandums of understanding.

Data
Strengths All these NSOs currently receive administrative data related to the population. The datasets have common geographic identifiers and a birth record. Two NSO have a census covering children and adolescents by key socioeconomic characteristics and by some regions/subregions. One draws the information from a 2016-17 survey. The other is currently using a 2010 census (with estimated under-coverage of 7%). One NSO does not have this information. Three NSOs have a unique personal identifier in their countries for the administrative data of interest. For one of them, the unique identity number was assigned at birth registration starting in 2011. Before that year, only the identity card that is issued from the age of 16 years is available. The fourth NSO does not have a unique personal identifier and does not have sufficient information to conduct probabilistic linkages. Microdata on people is currently being exchanged. Two of the NSOs apply an encryption method for sensitive information while the other two do not. All four have a process for tracking and regularly updating administrative and survey data records over time. Weaknesses NSOs are not fully certain about the completeness of the existing or upcoming information about children and adolescent populations by socioeconomic characteristics and by regions. All but one of the NSOs consider that the common data structures for children and adolescents will not be sufficient to allow the linking of administrative data records. All four NSOs indicated that data providers do not transfer metadata or adequate documentation from their administrative data sources, including data dictionaries, metadata files and others. Two NSOs do not have an internal centralized system that allows the receipt of administrative data records. They anticipate other data quality challenges such as

the implementation of data-quality checks and resistance from departments to share data.

Opportunities

The NSOs indicated that common data structures are sufficient to allow for linkage of administrative data records and an internal centralized system that allows the receipt of administrative data records.

All are confident in having the support of line departments to assist with data quality controls that the NSOs will undertake, including relevancy, accuracy, completeness and timeliness on the data records that line departments would share for data linkage.

All NSOs except one have a process for tracking and regularly updating administrative and survey data records over time.

Threat

There is a possible lack of public trust that platforms integrating administrative data will be secure and will protect privacy of the information. All NSOs consider public trust in the integrity of data linkage activities as a risk. They all recognized the need for careful risk management related to the security, privacy and confidentiality of administrative data.

Information technology, human resources and other issues

Strengths

All but one NSO have the necessary technological elements to implement data linkage, for example, server capacity, computers or software.

All the NSOs have considered where the new data would be hosted. A central repository for administrative data is implemented in two NSOs, while others don't have one. For the two that have a central repository, it takes the form of a data warehouse for one and a server for the other.

A common and controlled source ensures that everyone has access to consistent, up-to-date, and non-redundant information.

All but one NSO have adequate processes to execute data extraction and to provide technical support to allow access to new data platforms.

Weaknesses

Two of the NSOs do not have adequate data storage capacity and there is no purchasing plan for adding capacity. Other challenges mentioned include:

- Anticipated technical issues with data linkage, including data quality processes and data corrections.
- Lack of trust in the NSOs linking personal information, need for transparency for linking activities and the need for an awareness campaign for the public, the ministries and agencies. As stated by one interviewee "trust leads to sharing".
- Potential lack of engagement of some ministries to explore their strategic needs for data linkage.

Opportunities

NSOs have adequate processes to execute data extraction and provide technical support to allow access to new data platforms.

Two NSOs have the necessary human resources to proceed with the implementation of data linkage projects (including adequate skills and knowledge) and data capabilities (data architects, technical support, analysts, and others). The other two don't.

Threat

These NSOs recognize possible funding constraints as well as competition with other technical sectors that demand skilled employees.

5.6 Table 5: Type 4 Contemplating

The situations of the following 11 NSOs vary greatly: Cuba, Venezuela, Argentina, Brazil, Guatemala, Jamaica, Belize, Suriname, Saint Lucia, Nicaragua and El Salvador. They are all aware of the potential of linked administrative data for statistical purposes. They are contemplating the opportunities and multifaceted challenges as their systems are missing many systemic or foundational elements that will need to be addressed before being able to produce linked administrative data platforms.

It is difficult to make observations or to describe shared strengths, weaknesses, opportunities and threats for these countries in Type 4 given their heterogeneity. Moreover, some of them provided limited information or documentation.

Some of these NSOs stated clearly that there are other priorities in their agency, therefore there were no plans to undertake data linkage activities. Others did not state their position as clearly but described many systemic or foundational elements that still need to be addressed for the development of a data platform integrating administrative data.

Therefore, more general observations for these countries in Type 4 are grouped by themes below. For these countries, the written questionnaire for the diagnostic (*see Annex 2*) could be used as a checklist to develop their respective action plans for data linkage and development of administrative data platforms going forward.

Scope/need for data platforms

All NSOs in Type 4 make use of vital statistics (including information disaggregated by sex and gender, indigenous populations and population of individuals with disabilities in some cases). Most of the NSOs indicated that they have a formal plan for the statistical use of administrative data. For those who do, only a few have specific elements relating to children and adolescents.

While NSOs have discussions with data providers to collect administrative data, they all indicated not being aware of specific needs for data linkage by ministries or agencies in their respective countries. They are not aware of a research agenda related to children and adolescents that would benefit from linking some administrative data sources and surveys. There may be several reasons that contribute to this lack of awareness, for example, lack of tools or capacities to advance the agenda.

These NSOs consider that there are data gaps for the monitoring of SDG indicators for children and adolescents in their respective countries that could be addressed by linking some administrative data sources and surveys to produce data platforms. They also consider that data linkage could inform results from government programmes for children and adolescents.

However, data linkage was only considered by a few of these NSOs in the past. Note that the NSO of Brazil is conducting work on violent deaths including children and adolescents. This work is best described as data validation.

Most of these NSOs have produced statistical indicators with geographical, socioeconomic, or demographic disaggregation using administrative data, including, for example, sex and gender. Some of them have also considered further disaggregation.

Governance

Of the 11 NSOs, nine indicated having a national statistical law that grants access to administrative data. Of these nine, one indicated that other policies or regulations conflict with this law. One other said that the access granted was clear on legal grounds, but that data providers are resisting requests to share their administrative data. Access to administrative data is based on memorandums of understandings between institutions, with strict conditions for the usage of the data to ensure privacy and security of the information.

One NSO indicated that going forward, it is open to promote its services to conduct data linkage in support of the research and policy needs of other institutions. There is, however, no capacity to do so currently.

Some NSOs seek to improve the methods to work with administrative data within the framework of the ECLAC working group on Tools for the Evaluation of the Quality of Administrative Records.

There are no formal committees for the management of administrative data and for data linkage in these NSOs.

Data issues

Of the 11 NSOs, nine indicated having a unique personal identifier to enable data linkage. The identifiers are provided at 9 and 16 years of age in two of these cases. The others who do not have a unique personal identifier indicated that it would be difficult to proceed to linking based on personal information about children and adolescents.

The readiness of the NSOs to receive data and to prepare it for linkage is generally limited.

There are generally some concerns about the feasibility of sharing data platforms safely while protecting privacy. Most NSOs are concerned about the lack of common structures for linking, the lack of breakdown by socio-economic and demographic characteristics (including sex and gender), limited use of encryption method for data sharing, and quality control issues for the data and associated metadata.

Information technology, human resources and other issues

The questions sought to determine the readiness of systems in terms of structures, software, and computers for storing, retrieving and securely sharing information. This could relate to the adequacy of technology such as server capacity, computers and software, secure data storage capacity and location, central repository acting as a common and controlled source, and data extraction processes. The other issues included human resources, change management, budget, communication activities and support needed from outside the NSO.

The information provided by the 11 NSOs on information technology, human resources and other issues in relation to data linkage was very limited. This is understandable given that some NSOs stated clearly that they have other priorities in their agency, with no plan to undertake data linkage projects. Others expressed a lack of engagement with ministries and agencies with regards to data linkage. They also described many systemic or foundational elements related to governance and data issues be addressed for the development of a data platform integrating administrative data.

5.7 Identified areas for external support

All the NSOs were asked if they would need support of any kind from outside of their institution. For the 21 NSOs who participated, the following were generally mentioned as areas where help would be useful to respond to the new demands expected to arise from the development of linked administrative data platforms:

- Support in defining projects, as well as statistical design and conceptual frameworks.
- Expert views on legal framework issues and risk management.

- Expert views on the management of data-linkage environments, including data-linkage software.
- Lessons on the development of a census or households statistics based on administrative data.
- Lessons on providing data access to outsiders, including experiences with remote access.
- Best practices to ensure transparency and public trust.
- The development or refinement of data quality assessments, especially on data completeness.
- Training of staff for working on data infrastructure, data processing, working with IT systems, navigating cloud infrastructure and using a data warehouse.
- A few mentioned data science skills in general, for both NSO staff and key partners in universities and ministries.
- One NSO indicated that it would welcome funding for research. One mentioned training on linkage methodologies or processes in general, access to a repository, mapping out of datasets and automation of systems.

It is possible that the option of experimenting with a small-scale sectoral platform integrating administrative data, as opposed to a broader integrated statistical system, may not have been considered by some of these NSOs. However, they too may be interested in the benefits of more timely and responsive statistics and may consider experimentation in the future (recognizing the need for robust risk management and strong ethical safeguards).

Finally, for the five NSOs who have not responded (**Barbados, Colombia, Ecuador, Guyana and Montserrat**), it is understood from short exchanges with some of them that they are focused on other priorities and were not able to engage with this diagnostic.

- Two NSOs in countries with a very small population shared that the development of a data platform integrating administrative data comes with a perceived risk that personal information would not be well protected.
- One of the NSOs considered the production of a small-scale sectoral platform of interlinked data in the past but has not implemented it thus far.

6 Recommendations and Action Plan

National statistical systems in the LAC region are at various degrees of readiness to produce and support data platforms. However, all NSOs regardless of their readiness, as per the typologies in Section 5, could establish the sequencing and timeframes for the implementation of actions considering their own national priorities, capabilities and institutional context. Therefore, all countries can consider each of the 11 recommendations and suggested actions which are presented below by thematic areas.

It is important to note that while these recommendations focus on drawing insights on children and adolescents, the recommendations are more broadly applicable. Given the nature of statistical systems built on administrative data, many of the recommendations relate to systemic and foundational issues for data linkage, integration and development in general and not to data on children and adolescents specifically. However, improving the quality and use of administrative data for children and adolescents is the agenda promoted by the Working Group with this report.

6.1 Table 6: Demand for data platforms (scope)

Recommendation 1: Strategically undertake or expand activities for the development of platforms linking and integrating administrative data through stand-alone projects or through the integration of existing platforms with the purpose of implementing short-term activities which build towards long-term strategies.
Rational: • All participating countries still have some systemic or foundational issues to fix. These relate, to varying degrees, to the engagement of stakeholders and users to determine their needs for data linkage, the readiness of legal and administrative structures, data, information technology, human resources and other issues. • An experimental approach can allow an NSO to contain risk level and costs, and support capacity development. It can enable the scaling up of linkage activities over time, based on lessons learned. This recognizes however the need for experimenting with robust risk management and strong ethical safeguards.

- An experimental approach could also enable the NSO to work through the pertinent data roles and responsibilities including data ownership, data custodianship, data users, researchers and clients.
- A small-scale experimental approach could be a good point of entry into data linkage for many NSOs. The development of small-scale statistical infrastructure could be more attractive to some than the development of broad integrated statistical systems which require upfront investment before a return is apparent.
- An experimental approach does not preclude later attempts to integrate large numbers of social, economic and business datasets. However, a broad systemic integration plan could benefit from the lessons learned through experimentation that also promotes culture change over time.
- Such an approach will lead to systems enabling connecting variables from different thematic sectors and the creation of profiles over time of a country's children and adolescents.

Action:

- While building towards long-term strategies, NSOs should plan to experiment with the development of small-scale and perhaps sectoral or cross-sectoral platforms linking and integrating administrative data.

Risks and mitigations:

- Person-level data linkage is a complex activity that requires well established privacy protection and security measures to not compromise confidentiality. Therefore, NSOs should work with data providers to identify knowledge gaps that could be filled by linked administrative data platforms for statistical purposes (not for identifying persons for the administration of a programme) in areas of lower risk, or of less sensitivity (e.g., education related data as opposed to individual health or public security information).
- Data providers with whom the NSO already has a strong relationship should be considered for experimental projects.
- Data providers may be interested in using data platforms for administrative or case management purposes. This use falls outside of the mandate of an NSO.

Indicators of progress:

- The number of data linkage activities that are implemented, strengthened or expanded in a year.

Other considerations:

- The production of a statistical population register would be a strategic investment to pave the way to more data linkage activities to follow (this is being done in some countries already).
- For the NSOs who have not implemented a data linkage project yet, the initial work on a small-scale project could produce concrete results, demonstrating the potential of the linkage activities. This would help to make the case for, and drive investments in solving systemic and foundational elements, and will accelerate the maturation of statistical systems.
- Some NSOs are already missing leadership opportunities on data linkage. Some ministries are developing their own platforms of linked and integrated data along with internal capacities as well. NSOs are better positioned, however, to lead in this innovation space for statistical use of data. They have a well-established expertise in the statistical use of administrative data. They have better privacy and ethical norms. They are trusted as national data stewards and can better manage risks associated with data linkage. In their positions, they can access a broad range of independent administrative data sources and ensure that information is not used inappropriately.
- While undertaking or expanding activities, NSOs must carefully consider the criteria for data linkage and integration including accuracy, completeness, consistency, validation and privacy.

Recommendation 2: Build an approach to the acquisition and linkage of administrative data that considers stakeholder needs and recognizes the reciprocity of the relationship between institutions.

Rationale:

- Identified as a common theme, many NSOs in the region consider ministries and agencies as data providers only, and not as stakeholders or potential users of data platforms.
- Many participating NSO have limited discussions on the needs of ministries and agencies for data linkage and integration. Those who have already engaged more systematically with key ministries and agencies could move from an ad hoc approach to a more structured and periodic cycle of discussions.
- Consultation processes and more regular discussions will also help ministries and agencies to better understand the NSOs' capacities to manage related risks (including data privacy and security).

- Consultation processes and more regular discussions will also support strategies to increase data quality from the source (i.e., collection of administrative records) and throughout the data development value chain.
- The United Nations Fundamental Principles of Official Statistics suggest that statistical agencies be advised to organise regular dialogues with users to understand their needs and the purpose statistics should serve (fit-for-purpose paradigm).

Action:

- NSOs currently engaged, or those who will engage, with ministries and agencies on their information needs that can be met by linked administrative data should commit explicitly in their strategic plans to support the needs for platforms which link and integrate administrative data. This should include a yearly consultation process of key ministries and agencies on their needs for the integration of administrative data. NSOs should also consider supporting key ministries and agencies with research capacities to promote the statistical use of platforms.

Risks and mitigations:

- Ministries and agencies may lack motivation to discuss their knowledge gaps which could be filled by platforms integrating administrative data. For government officials dealing with ministerial pressures, data issues are often recognized as important but rarely as urgent matters. Data management processes should include periodic discussions on needs for linked data, including the need for disaggregation by subregion or by other socio-economic characteristics. This recognises however that it will take time to establish and maintain ongoing, mutually beneficial relationships with data providers.
- Having unique points of contacts between the institutions will help to maintain productive and disciplined information exchanges on linked data.

Indicators of progress:

- Number of instances of annual discussions and consultations.
- Number of ministries and agencies that participate in these instances.

Other considerations:

- The Code of Good Practice in Statistics for Latin American and the Caribbean includes the following as compliance criterion for the relevance principle:

"…Users and producers of official statistics must participate in the processes of identification, analysis and evaluation of information requirements through academic, inter-institutional and sectoral committees."

- NSOs may use these engagements with ministries and agencies to discuss the collection of sex and gender information in administrative data and also highlight the opportunities for gender-based analysis. According to the guidelines for Gender Mainstreaming in the Working Groups of the Statistical Conference of the Americas, the disaggregation of data by sex is the minimum requirement for the inclusion of a gender perspective in statistics. These engagements may also be a forum to discuss how administrative data may be used to inform decision-making and inform and monitor specific policies and programmes to promote equal opportunities and inclusive development.
- NSOs may develop the capacity to standardize concepts, establish nomenclatures, and propose quality improvements with data providers through focal points.
- As per the guiding principles for the development of national statistics development programmes of the Cape Town Global Action Plan for Sustainable Development Data:
  - "… necessary actions are to generate quality and timely data on a routine basis to inform sustainable development at the requested level of disaggregation and population coverage, including for the most vulnerable and hard-to-reach groups…"
  - "…The modern production of statistics requires comprehensive interaction among data providers, producers, and users. Therefore, trust among data providers, producers and users of statistics is key for the effective functioning of the national, regional, and global statistical systems in full adherence with the UN Fundamental Principles of Official Statistics …"
- The Cape Town Global Action Plan contains many recommendations for the development of key statistical capacity-building needs. NSOs could consider some of the additional actions proposed in this document. Although the actions are not specific to administrative data linkage, many maybe relevant.

6.2 Table 7: Governance

Recommendation 3: Promote safe access and seamless use of platforms linking and integrating administrative data for statistical use outside the NSO, including stakeholders, data users, decisionmakers and researchers.
Rationale: • Broad access and usage to data platforms contributes to greater societal benefits. NSOs must develop protocols for such, or could consider improving existing protocols, for example facilitating remote access to data platforms.
Action: • Implement and communicate user-friendly protocols and technology for external users to access and use data platforms.
Risks and mitigations: • There is a risk of negative perception from the public and stakeholders about user-friendly and broad data access by users outside of the NSO. Clear and proactive communications to the public on the measures taken by the NSO to ensure safe usage will mitigate this risk. The messages should stress the robust data management framework and protocols to ensure the security and privacy of the information is maintained.
Indicators of progress: • The improvement of the user experience, including the reduction in time necessary for a user to access data after the initial application for access.
Other considerations: • The NSO should consider a data access protocol for a broad range of users, including: ministries and agencies, universities, civil society groups, independent consultants and researchers. • Adjust user accreditation and data controllers' approval processes as necessary to ensure the security and the protection of privacy of data accessed by persons external to the NSO. • Implement adequate data extraction processes and technical support to enable safe and easy access to administrative data and to data platforms. • Use of platforms should be assessed against a data ethics framework. • Promote the discoverability of data platforms and metadata.

Recommendation 4: Promote transparency by informing stakeholders about the secure activities undertaken to link and integrate administrative data for policy development, service improvements, and reporting on results.

Rationale:

- There is a general lack of understanding about the capacities of NSOs to mitigate risks associated with linking and integrating administrative data. All NSOs regardless of their level of preparedness for linking data should consider investing in some additional communication activities.

Action:

- Build an administrative data management framework including effective intra-NSO and inter-institutional communication activities in line with Open Government Partnership Principles. This could include a data linkage workplan embedded in the NSO annual strategic plan.

Risks and mitigations:

- The risks associated with data linkage may be more tangible than the long-term benefits. Some stakeholders may limit their involvement in data linkage as they do not recognize the benefits, which can negatively impact collaboration. NSOs should work with key ministries and agencies to:
  - Explain the measures taken to mitigate risks.
  - Showcase some powerful examples of data linkage being used in government to support evidence-based policy making, service improvements and reporting on results.
  - Work with networks to promote these inspiring success stories at annual conferences. These may be supported by the UN or UNICEF.

Indicators of progress:

- The number of projects approved for the use of administrative data and the number of platforms integrating administrative data each year.
- The number of collaborative projects, including data exchange agreements.

Other considerations:

- Open data initiatives are consistent with the Fundamental Principles of Official Statistics.

Recommendation 5: Build and maintain public trust in the use of linked administrative data for statistical purposes while demonstrating the positive impact of the data.
Rationale: • Administrative data linkage activities are by nature privacy-invasive and active consent from citizens is not typically sought. Therefore, upholding public trust in these activities and how data are protected while simultaneously demonstrating the impact linked data has can help promote social acceptability of this work.
Action: • Measure levels of public trust within the country and develop strategies for building and maintaining this trust. • Communication avenues may include, for example, the NSO website and social media.
Risks and mitigations: • There may be a risk in not proactively disclosing administrative data linkage activities for statistical purposes. An NSO may be viewed as deliberately not reporting activities even when this is not the case.
Indicators of progress: • The number and/or reach of proactive disclosure materials (this may include web and social media metrics).
Other considerations: • Countries such as New Zealand have developed communication strategies for their linked administrative data platforms. These could be used to inform communication activities in the region.
Recommendation 6: Promote a legal framework that reinforces the role of the NSO in acquiring administrative data for statistical purposes.
Rationale: ○ NSOs require a strong legal framework to collect survey data directly from citizens and to acquire administrative data for use in statistical programmes. ○ As ministries have policies in terms of collecting and protecting administrative data on their programmes, a legal framework for collection and use of data within the NSO must consider a broader legislative framework.

○ Administrative data linkage activities across datasets increase the complexity and need for a legislative framework.
Action: • Create a senior committee or mandate an existing committee for legislative review. • Elaborate policies and guidelines with the required technical criteria, both for the provision and production of statistical data.
Risks and mitigations: • To ensure action on the part of the committee, build-in accountability of the committee to an external body. • Allocate appropriate funding for the initiative.
Indicators of progress: • Number of committee discussions assessing the need for legislative change. • Final committee recommendations on the need for legislative change. • Number of changes to legislation.
Other considerations: • Changes to legislative frameworks are complex and often long-term undertakings. It should be expected that such change requires concerted ongoing effort.

6.3 Table 8: Data issues

Recommendation 7: Strengthen the development and use of tools for measuring the quality of administrative data and linked administrative data for statistical purposes on children and adolescents which includes quality indicators such as: completeness, coverage, consistency, validity, timeliness and accessibility of the data.
Rationale: • There have been many advances in the LAC region on indexes and tools for measuring the quality of administrative records. For example: the Tool for Evaluating the Quality of Administrative Records developed by the National Institute of Statistics and Geography of Mexico; the Instrument for Measuring the Quality of Administrative Records (IMCRA) developed by the National Institute of Statistics of Chile; the Self-Assessment of the

Quality of Administrative Records of the National Institute of Statistics of Uruguay; and the Questionnaire for Evaluating the Quality of Administrative Records used in the framework of the Administrative Records Quality Control led by the Inter-American Development Bank (IDB) and the United Nations Statistics Division (UNSD) for the improvement of the quality of administrative data in Latin America and the Caribbean. These advances should be applied to children's and adolescents' data.
Action: • Develop and apply measurement instruments in NSOs that do not have such instruments.
Risks and mitigations: • Fitness for use of these indices or tools for the use of children's data, which contains unique attributes, should be considered.
Indicators of progress: • Number of quality measurement instruments applied. • Number of administrative datasets evaluated with the instruments.
Other considerations: • NSOs should consider the impact of quality assessment work on administrative data operations in line ministries. • NSOs may consider establishing quality indicators associated with metadata and administrative data on children and adolescents. This may include: - **Relevance of the population,** definition of the statistical object (e.g., the age range of children). - **Unit relevance** defining the relevant administrative units. - **Matching variables,** existence of appropriate matching variables in the administrative datasets. - **Relevance of variables,** establish appropriate variables according to the needs of statistics on children, including sex and gender. - **Relevance of reference periods,** which are the appropriate reference periods for statistical use. - **Comprehensiveness,** define which statistical operations benefit from the administrative source; a source may benefit more than one statistical operation. - **Record updates,** frequency and timing of record updates. - **Comparability over time,** extent of changes in the content of the administrative record over time.

- **Quality of matching variables.**
- **Temporal references.**
- **Quality of matching.**
- **Measurement of population over- and under-coverage.**

- There may be an opportunity in the future to develop technical tools to support NSOs in measuring the quality of administrative data and linked administrative data on children and adolescents.

Recommendation 8: Adopt a set of broadly used and accepted principles for the provision of safe access and usage of administrative data for statistical purposes.

Rationale:

- It is recognized that only a few NSOs have provided access to linked data in the past. While they have adopted strong provisions for data access, they would benefit from clarifying if these measures are aligned with international standards and conventions. Other NSOs should also consider adopting an international standard or conventions when planning to undertake data linkage, given the known risks associated with these activities.
- The Five Safes is a strong framework for managing and protecting data that is shared with inside or outside users. Developed by the United Kingdom Office for National Statistics in 2003, it has since been adopted by several government organisations and by Eurostat. These controls ensure that data projects can go ahead:
    - Safe projects: Research projects are approved by data custodians or providers for the public good.
    - Safe people: Researchers are trained and authorised to use data safely.
    - Safe settings: A secure environment prevents unauthorised use.
    - Safe data: Data is treated to protect any confidentiality concerns.
    - Safe outputs: Screened and approved outputs that are non-disclosive.

Action:

- Alignment of administrative data management activities to the Five Safes Internal Audit Program which promotes robust risk management, including data anonymization and strong ethical safeguards.

Risks and mitigations:

- There may be internal resistance to adapt the NSOs current framework for data safety. One option is to ensure at minimum the consistency of the NSO's practices with the Five Safes and be transparent about the approaches undertaken.

Indicators of progress:

- The perceived reduction in the risk for security or privacy breach, and other misuse of data over time.

Other considerations:

- An alternative to the Five Safes is the Seven Governance Controls from Data Republic (Why Five Safes Aren't Enough for Inter-Organizational Data Exchanges (datarepublic.com). It adds two controls in addition to the Five Safes.
- The Responsible Data for Children (RD4C) initiative seeks to build awareness on how data affects and is affected by children. Importantly, it advocates for informing and engaging with children better. In particular, it stresses the importance of mitigating the risks posed by an increasingly driven society. The RD4C can help mitigate these risks with actionable ways to put the best interests of children at the center of data use and reuse activities involving data for and about children.

Recommendation 9: Strengthen the organisational structure and clarify roles and responsibilities for data linkage, integration and development activities within the NSO.

Rational:

- Data linkage, integration and development is a complex and relatively new activity that draws from various parts of all the NSOs regardless of their level of preparedness for these activities. Where a responsibility begins and ends may not always be clear to everyone.
- Most NSOs will have to establish roles and responsibilities for data linkage, integration and development activities in the future. Those who have established structures should further formalize or clarify some elements of their governance system. This may include, for example, who does what for the management of data access by staff from external organisations.

Action:

- Clarify the roles and responsibilities within the NSO for activities related to administrative data, including the accountabilities for individuals and for

related committees. Consideration should be given for the formal committee structure to include a data linkage committee. This committee would oversee risk assessments including legal issues, risk mitigation strategies, a public benefit assessment process, decisions on data destruction (or curated data for future use) and the promotion of transparency to uphold public trust.

Risks and mitigations:
• Despite efforts to provide clarity, there is a risk that accountabilities may not always be understood, leading to lack of efficiency or a lack of oversight for some activities. Consider also:
  ○ Establishing clear accountabilities for the collection, documentation, storage and use of administrative data in performance agreements of implicated employees.
  ○ Nominating an NSO senior official to be accountable to the Chief Statistician for the coordination of data linkage activities.

Indicator of progress: • Increased organisational efficiency and data quality. • The perceived reduction in the risk of security or privacy breaches, and other misuse of data over time.
Other considerations: • Committee structures sometimes include a Data Ethics Committee. Elements of the governance structure sometimes include a committee to oversee the anonymization process, administrative data user accreditation process, data controllers' approval process and a public benefit assessment process.

6.4 Table 9: Information technology, human resources and other issues

Recommendation 10: Plan in advance for the technological and human elements necessary to implement data linkage, integration and development.
Rational:

- All NSOs reported needs for investments in information technology and human resource capacities going forward. It will take time to obtain authorisation for additional salaries and for the purchase of equipment. Time will also be required to develop skills and for the implementation of new technological elements. With planning for the specific needs of data linkage, integration and development activities, key elements for projects will be in place and staff will be provided with lead time to develop the necessary knowledge and skills for timely project undertakings.

Action:

- Map out future needs which may include data architects, data scientists, analysts, methodologists, technical support, and central repository capacity (data warehouse, data lake or data mart), record linkage software, encryption technologies, computers, software and other needs.

Risks and mitigations:

- Given the uncertainties that NSOs face for data linkage activities, consultations with other NSOs with well-established systems and resources may help in developing investment options going forward.
- An experimental approach with a small-scale project that builds towards a long-term strategy can allow an NSO to contain risk level, costs, and allows to develop capacity and to scale up linking activities over time, based on lessons learned.

Indicators of progress:

- The degree of completeness of the NSO's information technology and human resource plans related to data, integration and development linkage activities.

Other considerations:

- Identify specifications for interoperable technologies and approaches (e.g.,, Statistical Data and Metadata eXchange – SDMX) to incorporate flexibility in systems for official data collection, processing, dissemination and analysis.
- Encourage the adoption of technologies that promote the integration of different types of information.
- For data linkage, some organisations have started the journey by building programs in R, SAS, SPSS, SQL, while other software available include G-

link and Link King. New record linkage technologies, including those based in blockchain, are emerging as well.

- Taken together, moving towards integrated systems of administrative data on children requires a strong approach to change management. Change management much consider governance, NSO policies, organisational culture and all enablers.

Recommendation 11: Attract talent to the NSO.

Rational:

- All NSOs have indicated the need for development of statistical and data science skills. Development of technical skills related to systems design, data infrastructure development, data processing, as well as conceptual frameworks are also needed. Knowledge transfers from strong technical professionals would accelerate the development of capacities and organisational change.

Action:

- Implement an assignment programme for strong technical professionals to join the NSO on a temporary basis to work on special administrative data linkage related projects.
- Implement work placement programs for university students and partnerships with universities.
- Develop career pathways and strategies to retain developed talent within NSOs.

Risks and mitigations:

- The supervision and management of a professional on assignment from outside the NSO can be time consuming. The NSO could design professional assignments that involve rotations to multiple managers. This would help managers to cope with the additional supervision work while providing the professional with a broader exposure to relevant data management activities.

Indicators of progress:

- The perceived development of capacities and organisational change resulting from an assignment.

Other considerations:

- As an example, Statistics Canada currently offers assignments as a "Fellow" to work within a specific department on a specific project. The project depends on the skill set of the individual and the project's requirements. Statistics Canada will match suitable candidates to projects

and departments. Length of assignments will range from 12-24 months on average. While working as a Fellow, the person will have access to a Statistics Canada peer and communities of practice and expertise to collaborate with and discuss his/her project. These leaders help increase data science capability across the Government of Canada (*see https://www.statcan.gc.ca/en/data-science/fellowship*).

- Consider the organisation of a hackathon or a similar activity. This could attract high-calibre data scientists, data architects, IT specialists, statisticians and analysts. These activities promote innovation and can be part of the communication strategy of the NSO to promote the attractiveness of its work environment. Hackathons are an effective way to find skilled individuals who could potentially be recruited. The NSO in Uruguay may have some lessons to share based on its recent Hackathon.

7 Conclusion

Change is happening as NSOs in the Latin American and Caribbean region are seizing opportunities for effective statistical use of administrative data for children and adolescents. The activities of the Statistical Conference of the Americas are promoting the advancement of this strategic agenda. The Statistical Conference of the Americas is also supporting a collaborative team community on best practices for the integration of administrative data for policy development, service improvement, and for reporting on results.

Within the Latin American and Caribbean region, national statistical systems are at various degree of readiness to produce platforms linking and integrating administrative data for statistical use. Nevertheless, many NSOs have been working together and are benefiting from the sharing of their best practices. Many NSOs are also working on their own and together to strengthen their capacities and to improve the quality and the coverage of administrative data for statistical use. Some NSOs are focusing on the creation of integrated and coordinated register systems, or on the development of small-scale sectoral data platforms. Moreover, in some countries, efforts to set up appropriate statistical legal frameworks are being made to allow data sharing while safeguarding confidentiality.

Certain NSOs are actively participating in the ongoing work of the Collaborative on the Use of Administrative Data for Statistics led by the UN Department of Economic

and Social Affairs. Development efforts have also been supported by the IDB, UNSD and ECLAC and may have benefited from some of the South-South cooperation activities.

This administrative data readiness diagnostic has been based on information from the 21 participating countries, but the recommendations and proposed actions could be of interest to all NSOs in the region.

1. NSOs in Costa Rica and Uruguay are already working with partners to **implement** their data linkage projects and platforms. They have already addressed most of the systemic and foundational issues related to this work.

2. NSOs in Chile, Honduras, Mexico, and Peru are **enabling** data linkage activities, recognising that data linkage is not a priority currently, or that some of their systemic or foundational elements remain to be addressed.

3. NSOs in Bolivia, the Dominican Republic, Panama and Paraguay are interested in leveraging more value from administrative data in their country and are at the stage of **initiating** their work.

4. Finally, a last group of NSOs (Argentina, Belize, Brazil, Cuba, El Salvador, Guatemala, Jamaica, Nicaragua, Saint Lucia, Suriname and Venezuela) are aware of the benefits of data linkage and integration for statistical purposes and are contemplating the opportunities and the multifaced challenges they face.

The NSOs in the LAC region have many strengths from which they can build and improve the quality and use of administrative data for statistical purposes. As national data stewards, they have well-established expertise, processes and workplans for the statistical use of administrative data (with or without specific elements for children and adolescents). Most NSOs already receive microdata on their population. These data transfers are based on administrative agreements with data providers, whether the national statistical law is clear or not on the obligations and modalities.

Many NSOs face several challenges, however. The first one being a lack of understanding by many ministries and agencies of the benefits of data linkage and integration and of the NSOs' capacities to manage related risks (including data

privacy and security). In general, the NSOs report that this translates into time-consuming efforts in negotiating access to quality data.

The more benefits ministries and agencies can recognize from administrative data linkage and integration, the more motivated they would be to collaborate and share their data with their NSO. If the benefits of data linkage and integration are not tangible, then the main motivation is the legal obligation to share their sensitive data to the NSO. This may lead to ministries and agencies not investing efforts in building the lasting relationship that are necessary to support data sharing and linkage activities. This is unfortunately the situation that was observed to various degrees in most countries in the region. Many NSOs seem to consider ministries and agencies as data providers only, not as stakeholders or users of linked and integrated data. NSOs should consider undertaking or expanding data linkage activities based on a more stakeholder-oriented approach.

Promoting mutual understanding and a strong collaboration will help create strategies for administrative data platforms in support of policy development, service improvements and reporting on results. Understanding the perspectives and needs of ministries and agencies will help NSOs to drive the administrative data linkage agenda for purpose and influence.

Another challenge is that many NSOs do not have the right governance frameworks in place, including some legal and regulatory issues yet to be addressed. Data linkage is a complex activity, and the implementation of projects requires the collaboration of many stakeholders. For all aspects of the operations to come together, the governance framework for the NSOs and for institutional stakeholders needs to exist at the right level.

Therefore, many NSOs should continue to promote revisions to laws that address access to administrative data and data platforms. This also calls for clear roles and responsibilities to ensure that administrative data are managed safely as a strategic statistical asset, based on detailed administrative agreements with data providers. Governance structures will support focused and strategic investments to leverage higher value from administrative data.

The participating NSOs in this diagnostic share a view on the importance of nurturing and maintaining the trust of citizens and stakeholders in their respective countries. Some experts see public trust as the main risk associated with linking administrative data. Therefore, NSOs should adopt high standards for proactive

communication and transparency in the planning and conducting of administrative data linkage activities.

Finally, the complex tasks related to building and maintaining administrative data platforms can only be accomplished with professionals that NSOs need to attract, train and retain. Individuals are at the heart of data sharing and its strategic use for influence. The people engaged in designing, providing, collecting and interpreting data are crucial in enabling data use for policy influence and reporting on results.

In conclusion, it is recognized that as more general population administrative data (which include coverage of children and adolescents) are produced and used for statistical purposes, it is important to underscore children's data to ensure that integrated statistical systems of administrative data are invested in, built, and maintained in a manner that considers the unique attributes of children's administrative data and ultimately has the greatest impact for them. As a first step, this diagnostic focuses on the demand for linked administrative children's data for statistical purposes with consideration for close links with population-level linked administrative data. Future technical products developed by the Children Statistics Group will focus on the contextual, technical and governance considerations which differentiate children's administrative data from other types of administrative data used for statistical purposes.

Annex 1: List of individuals who participated in the qualitative research

Argentina **National Institute of Statistics and Census** Romina Mansilla Martin Chojo Andrea Lorenzetti Valeria Giner	**Belize** **National Institute of Statistics** Diana Castillo-Trejo
Bolivia **National Institute of Statistics** Mabel Paton Marcos Castellon	**Brazil** **Institute of Geography and Statistics** José Eduardo de Oliveira Trindade Maíra Bonna Lenzi
Chile **National Institute of Statistics** Aylin Flores Hinojosa Diego Rodriguez Rodrigo Silva Rodrigo Morales Pedro Ruz	**Costa Rica** **National Institute of Statistics and Censuses** Sofia Mora Steiner German Gutiérrez Marrin
Cuba **National Office of Statistics and Information** Norkis Plasencia Padrón Enrique González Galbán	**Dominican Republic** **National Bureau of Statistics** Carlos Hernandes Kisoris Sanchez Braudilia Garcia Roberto Soriano
El Salvador **Department of Statistics and Censuses** Balmoris Madrid Francisco Munguía Pedro Hernández	**Guatemala** **National Institute of Statistics** Hugo Garcia
Honduras	**Jamaica**

National Institute of Statistics Maria Lopez	**Statistical Institute** Leesha Delatie- Budair
México **National Institute of Statistics and Geography** Eric Rodríguez Toribio Sánchez Pilar García Jairo C López Alfredo Mendoza	**Nicaragua** **National Institute of Information Development** Saurasani Castañeda Josefa Blanco
Panama **National Institute of Statistics and Census** José Eliécer Sánchez Dalis Carrión Fluvia Alicia Ibarra Herrera	**Paraguay** **Department of Statistics, Surveys and Censuses** Lourdes Leguizamon Oscar Barrios Mirta Leiva Lilian Ferreira
Peru **National Institute of Statistics and Informatics** Doris Mendoza	**Saint Lucia** **National Institute of Statistics** Sean C. Mathurin
Suriname **General Statistics Office** Eartha Groenfelt	**Uruguay** **National Institute of Statistics** Federico Segui Cecilia Alonso
Venezuela **National Institute of Statistics** Dinoira Moreno Perdomo	

Annex 2: Written Questionnaire

Working group for the diagnostic of and recommendations for the integration of administrative records related to children

Context

The Working Group for the diagnostic of and recommendations for the integration of administrative records related to children is making efforts to improve the capacity to produce statistics in the region.

This questionnaire is a tool to evaluate the current state of administrative data systems, identifying typologies of maturation of these systems with respect to their feasibility of incorporating the development of linked administrative data platforms (interconnected data) in public policy sectors related to children and adolescents (e.g., education, work, training, health, and justice). This refers to linking data from multiple sources (i.e., from different administrative registries and surveys) within countries. Such platforms would allow for:

- Obtaining more cost-effective and timely evidence about children and adolescents to support the design of policies and programmes.
- Attributing impacts to programmes where relevant (cause-and-effect relationships, cost-benefit analysis, and return on investment calculations).
- Improving monitoring of progress towards the SDG targets for children and adolescents by 2030.
- Expanding research on the determinants of children's security and development outcomes.

The diagnostic will be based on this questionnaire, interviews, a review of documentation, consultations and workshops with external experts. This diagnostic will support the development of system typologies in the region. This will lead to the development of strategies or recommendations to prepare each type of system to link data from administrative records or surveys. In the medium term, this will allow countries to accelerate the development of their population-related administrative records. In the long term, this could also lead to the production of data on children and adolescents with greater frequency, quality, and greater disaggregation, in line with the priority areas of each country.

This questionnaire will be relevant only to countries that are considering linking some of their administrative records and surveys to create data platforms. For other countries that are not interested, they should notify us. For these cases, only short discussions will be sought to understand their positions.

Instructions

The questions fall into five categories: Scope, governance, data, technical support (IT) and other questions. These will help identify challenges, including: regulatory/legal, political, data or other technical issues. They will also help identify the support needed to address these challenges.

You are asked to provide answers by June 30, 2022. The 49 questions require yes or no answers. You can add comments if you want. You will probably need to involve representatives of government departments who are considered key players given the specific opportunities you may be considering. In some cases, it is possible for a line ministry to monitor the existing system in your country. In that case, it would be important to have their participation. The questionnaire is intended to prepare more detailed discussions lasting two hours, sometime between July and September 2022, through virtual meetings. These discussions should also include representatives from key government departments that you consider relevant at the time.

The information provided during the diagnostic process will not be attributed to specific people, but rather, to institutions, for example: the National Statistics Office, the Ministry of Education and others. With this in mind, please:

1. Complete the following questionnaire to your knowledge.
2. Answer all questions. In case any questions are not applicable, please select "NA (not applicable)".
3. Use the "Comments" space to provide additional details.
4. Share with us any documents that may help the diagnostic for your country (emails provided)
5. Provide the names and positions of the people who helped answer the questionnaire. These will be identified in a list of respondents in the report to be finalized in September 2023.

Questionnaire

I: Scope (demand for data)	**Answers (yes, no, working on it, NA)**	**Short comments, if any, at this stage.**
1. Do you have a work plan for the statistical use of administrative data?		
2. If you responded "Yes" to 1: Does the plan include specific elements relating to children and adolescents?		
3. If you answered "Yes" to 2: Did you identify the data sources that you need?		
4. Are there existing data gaps for the monitoring of SDG indicators for children and adolescents in your country that could be addressed by linking some administrative records and surveys to produce data platforms (interlinked data)?		
5. Are you aware of a research agenda related to children and adolescents that would benefit from linking some administrative records and surveys? This agenda could be in a line department or in other institutions (e.g., universities or others)?		
6. Did you consider if data linkage could inform results from government programmes for children and adolescents? For example, it could be for programmes in one or more areas to determine if these programs are efficient (i.e., if they meet their objectives). This could also be for impact analysis.		
7. Have you considered linking some administrative records and surveys to produce data platforms (interlinked data)?		
8. If so, did you consider what sectors could be of interest (e.g., education, labour, training, health, justice or others)?		
9. Have you produced statistical indicators with geographical or socioeconomic disaggregation using administrative data that offered adequate coverage for a population of interest?		

10. If so, have you considered if there may be a need for further disaggregation by sub-regions or by other socioeconomic groups, or for more frequent data collection?		
11. Can you share some documentation or more extensive written comments to help us further clarify the scope of activities?		

II: Governance These questions may not be applicable to your situation or could simply be better discussed during the upcoming discussions. If this is the case, jump to the next data category below.	**Answers (yes, no, working on it, NA)**	**Short comments, if any, at the stage.**
1. Is there a National Statistical Law that grants access to administrative data to your National Statistical Office (NSO)?		
2. Is the law governing the activities of your statistical activities in conflict with other national laws?		
3. Do you use collaborative agreements in your interactions with data providers?		
4. Are you already working to improve the collection and the dissemination of some administrative data related to population in the near future?		
5. Do you know if you have adequate processes in place for the collection of administrative data related to population, the assessment of risks posed by the data linkage activities, the data treatment, secure storage and access?		
6. Are you planning to take actions for data privacy protection (e.g., protocols for anonymization)?		
7. Do you have a process in place for outside organisations' staff (e.g., in government agencies and departments, universities or other research groups) to access and use administrative data platforms for policy analysis, research, and monitoring/evaluation?		

8. For the development of a linked data platform, do you anticipate having to secure the necessary support at senior levels in the line departments involved (e.g., signing new Memorandums of Understanding for the transfer and use of data)?		
9. Do you anticipate other challenges for the governance of your data linkage project?		
10. Can you share some documentation or more extensive written comments to help us further clarify governance issues?		

III: Data These questions may not be applicable to your situation or could simply be better discussed during the upcoming discussions. If this is the case, jump to the next information technology (IT) category below.	**Answers (yes, no, working on it, NA)**	**Short comments, if any, at this stage.**
1. Do you currently receive administrative data records related to population?		
2. If so, do they have common geographic identifiers and a birth registration?		
3. Do you have a census-based or an administrative registry of children by key socioeconomic characteristics and by some regions/sub-regions?		
4. Is a unique personal identifier available in the administrative data of interest?		
5. If you answered "No" to 4: Do you have enough personal information to allow children and adolescents to link to a platform (interconnected data)?		
6. Is there some microdata (data on individuals) being exchanged currently?		

7. If you answered "Yes" to 6: Do you apply any method of encryption for sensitive information?		
8. Did you consider if the administrative data records are based on common structures with enough commonalities to enable linking?		
9. In general, do you consider that the data have adequate metadata or documentation, for example data dictionary, metadata file or other?		
10. Does your National Statistical Office have an internal centralised system that enables the reception of administrative data records?		
11. Are you confident in having the support line departments for the data quality controls that you will undertake (e.g., relevance [meeting the needs of users], accuracy [correctly describing what it is designed to measure], completeness [required data is available], timeliness [available as quickly as possible]) on the data records they will share with you?		
12. Do you have a process for the periodic tracking and updating of administrative and survey data records over time?		
13. Do you anticipate other data quality challenges?		
14. Can you share some documentation or more extensive written comments to help us further clarify data issues?		

IV: Information Technologies (IT) These questions may not be applicable to your situation or could simply be better discussed during the upcoming discussions. If this is the case, jump to the other question categories below.	**Answers (yes, no, working on it, NA)**	**Short comments, if any, at this stage.**
1. Are you missing the technological elements necessary to implement some data linkage (e.g., server capacity, computers, or software)?		
2. Did you consider where the new data will be hosted?		
3. Is a central repository for administrative records implemented in your National Statistical Office? If your answer is yes, please specify (multiple answers are accepted): a. A data lake hosting unprocessed data, b. A data warehouse for data from many areas, c. A data mart which is usually focused on a single area and is oriented to a specific client or team, or d. Other		
4. If you answered "Yes" to 3: Does a common and controlled source ensure that everyone has access to consistent, up-to-date and non-redundant information?		
5. Did you consider if you have adequate data extraction processes and technical support in place to enable access to the new data platform(s)?		
6. Did you consider the possible need for additional service support to respond to		

new demands projected to arise from the new data platforms?		
7. Did you consider if your data storage capacity will be adequate for the new data platform(s)?		
8. In relation to question 7, is there a plan for the purchase of hardware for additional storage capacity?		
9. Can you share some documentation or more extensive written comments to help us further clarify IT issues?		

V: Other Questions These questions may not be applicable to your situation or could simply be better discussed during the upcoming discussions.	**Answers (yes, no, working on it, NA)**	**Short comments, if any, at this stage.**
1. Did you consider the human resources necessary to proceed with the implementation of your data linkage project (e.g., right skills and knowledge, data abilities [data architects, IT support, analysts]?		
2. Are you planning to grow your human resources capacity?		
3. Would you require some support (any type) from outside your institution?		
4. Would you consider some change management activities (e.g., capacity building and communication for awareness)?		
5. Is there any other information you wish to share with us?		

Annex 3: List of documents

Note: Internet addresses are given wherever possible. These were all checked at the time of writing.

UNICEF, 'The Administrative Data Maturity Model (ADaMM)', March 2022, https://data.unicef.org/resources/the-administrative-data-maturity-model-adamm/. Accessed September 11, 2023.

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