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Items for discussion and decision: social statistics

Background document
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Towards an overarching conceptual framework for social and demographic statistics[1]

Friends of the Chair group on social and demographic statistics

[1] This document will not be formally edited

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List of abbreviations

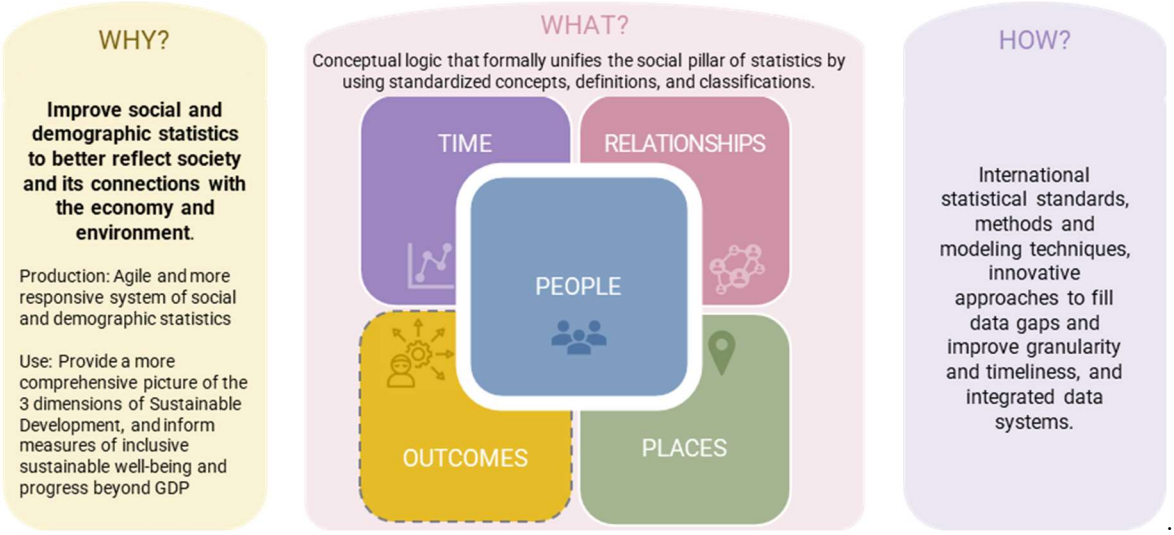
Abbreviation	Definition
AI	Artificial Intelligence
BPS Indonesia	Badan Pusat Statistik Indonesia - Central Bureau of Statistics Indonesia
IBGE	Brazilian Institute of Geography and Statistics
CASCH	Canadian Alliance for Social Connection and Health
CCHS	Canadian Community Health Survey
CCHS-MH	Canadian Community Health Survey, Mental Health
CHSCY	Canadian Health Survey of Children and Youth
CHSS	Canadian Health Survey of Seniors
CHS	Canadian Housing Survey
CSS	Canadian Social Survey
CRVS	Civil registration and vital statistics
CRS	Civil registration systems
CES	Conference of European Statisticians
CES	Conference of European Statisticians
COVID	Coronavirus Disease
DW	Data Warehouse
DEGURBA	Degree of Urbanisation method
EU	European Union
ETL	Extract, Transform, Load
FOCG-SD	Friends of the Chair group on social and demographic statistics
GSS	General Social Survey
GSBPM	Generic Statistical Business Process Model
GIS	Geographic information system
GILC	Global Initiative on Loneliness and Connection
GPS	Global Positioning System
GSGF	Global Statistical Geospatial Framework
GDP	Gross Domestic Product
HiAP	Health in All Policy
SDMI	Indonesia One Data on International Migration
IT	Information Technology
ICATUS	International Classification of Activities for Time-Use Statistics
ILO	International Labour Organization
LFS	Labour Force Survey
FLACSO	Latin American Faculty of Social Sciences
MPIDR	Max Planck Institute for Demographic Research
ENASEM	Mexican Health and Aging Survey
INEGI	Mexico's National Institute of Statistics and Geography
MHI	Minimum Harmonized Instrument
MPD	Mobile positioning data
MICS	Multiple Indicator Cluster Survey

DANE	National Administrative Department of Statistics of Colombia
NISR	National Institute of Statistics of Rwanda
NORC	National Opinion Research Center at the University of Chicago
NSO	National Statistical Office
NTTA	National Time Transfer Accounts
NTA	National Transfer Accounts
NES	Network of Economic Statisticians
WISE	OECD Centre on Well-Being, Inclusion, Sustainability and Equal Opportunity
LS	ONS longitudinal study
OECD	Organisation for Economic Co-operation and Development
PHC	Population and Housing Census
PES	Post-Enumeration Surveys
PTSD	Post-Traumatic Stress Disorder
RWB	Relational wellbeing
SAE	Small area estimation
SAIPE	Small Area Income and Poverty Estimates
Stats SA	Statistics South Africa
SSPC	Survey Series on People and their Communities
SDG	Sustainable Development Goals
ONS	UK's Office for National Statistics
UK	United Kingdom
UNICEF	United Nations Children's Fund
UNCEBD	United Nations Committee of Experts of Big Data and Data Science in Official Statistics
UN-GGIM	United Nations Committee of Experts on Global Geospatial Information Management
UNDESA	United Nations Department of Economic and Social Affairs
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNECE	United Nations Economic Commission for Europe
EG-ISGI	United Nations Expert Group on Integration of Statistics and Geospatial Information
EGWM	United Nations Expert Group on Well-being Measurement
UNPD	United Nations Population Division
UNSD	United Nations Statistics Division
SIREE	Uruguay's Integrated System of Statistical Records and Surveys
INE	Uruguay's National Institute of Statistics
TAG-SC	WHO Technical Advisory Group on Social Connection
WHO	World Health Organization
WPP	World Population Prospects

I.Executive summary

Social and demographic statistics are fundamental for measuring and monitoring the well-being of individuals, communities, and societies, across many domains such as health, education, labour, housing, or social protection. When integrated with economic and environmental statistics, they provide policymakers with a comprehensive understanding of sustainable development, enabling more informed and effective decision-making. The overall objective of the Friends of the Chair group on social and demographic statistics[2] is to produce specific recommendations for an agile and more responsive system of social and demographic statistics, in line with the central promise of the 2030 Agenda for Sustainable Development to leave no one behind while anticipating data needs beyond 2030. In 2024, the Group has been examining the feasibility of developing an overarching conceptual framework for social and demographic statistics supported by an integrated data infrastructure. Together, this framework and its enabling infrastructure aim to enhance the coherence of data and statistics across thematic outcomes in the social sphere by harmonising concepts, definitions, and classifications.

As a first step, the Group is exploring the development of an integrated social and demographic data infrastructure based on the premise that social and demographic statistics are fundamentally statistics about 'people' in 'relationship' with one another, that the events of our lives occur in 'time' and 'place', and that social statistics seek to understand population-level 'outcomes' as a well as distributional differences in these outcomes. This document presents some of the Group's preliminary findings, drawing on research and the sprints organized in 2024. The emphasis is on data integration in the first instance, working towards the shared multi-disciplinary evidentiary foundation that would be a prerequisite for a 'systems' approach to social statistics with explanatory power across the domains that comprise social statistics.



A. Why is a conceptual framework for social and demographic statistics needed?

1. Global context

The transformative power of data in advancing sustainable development has been underscored in the monitoring process of the Sustainable Development Goals (SDGs). High-quality, timely, and disaggregated data are indispensable for identifying challenges, formulating solutions, monitoring implementation, and making course corrections. Without an evidence-based understanding of progress, it is impossible to determine where the SDGs are succeeding or falling short. While notable improvements have been made in data availability—such as the adoption of well-established methodologies for all 231 SDG indicators—gaps persist. As of 2024, only 68% of indicators have adequate data coverage, and significant shortfalls remain in key areas for sustainable development. Moreover, a lack of recent data for many indicators hampers timely

[2] The Friends of the Chair group on Social and Demographic Statistics is a group established under the auspices of the Statistical Commission to review these statistical areas and provide recommendations for strengthened social and demographic statistics that better reflect society and its connections with the environment and the economy.

decision-making. Recognizing these challenges, the international community has emphasized the need for a robust statistical foundation, supported by coordination across national statistical systems. This involves integrating traditional data sources, such as censuses and surveys, with alternative data sources like administrative data and big data, applying innovative approaches, while strengthening governance frameworks to ensure data privacy, security, and accessibility.[3]

In 2022, the Friends of the Chair group on social and demographic statistics (FOCG-SD) was established under the auspices of the Statistical Commission and tasked with the review of this statistical pillar[4] and providing strategic recommendations for strengthened social and demographic statistics that better reflect society, as well as its connections with the environment and the economy. In 2024, the Statistical Commission endorsed the Group's efforts to advance research toward an overarching conceptual framework for social and demographic statistics. This framework aims to harmonize statistical concepts, definitions, terminology, and classifications across subdomains, aligning with the Group's objective of formulating strategic recommendations. The Commission also emphasized the importance of integrating diverse data sources, including geospatial information and administrative data, while prioritizing data protection and the development of robust data infrastructure.[5]

Recently, the General Assembly adopted the Pact for the Future, alongside the Global Digital Compact and the Declaration on Future Generations, to address escalating conflicts, geopolitical tensions, widening inequality, growing mistrust, stalled progress on the Sustainable Development Goals, and the intensifying climate crisis. This landmark declaration outlines clear commitments and deliverables across key areas, including sustainable development and financing, peace and security, digital cooperation, support for youth and future generations, and strengthened global governance. The Pact for the Future emphasizes the urgent need to accelerate efforts towards achieving the SDGs, placing people at the centre of all actions, and incorporating the needs of future generations into policymaking through long-term, data-driven anticipatory planning and enhanced cooperation. Recognizing the critical role of quality data in achieving the SDGs and improving crisis response, these initiatives prioritize closing data gaps, enhancing the availability of disaggregated data, and developing secure, accessible data systems. Commitments include boosting data financing, particularly in developing countries, and advancing metrics beyond GDP to capture human and planetary well-being. To support this shift, an independent expert group will recommend new indicators, complemented by an intergovernmental process to implement them, fostering a more comprehensive approach to global governance.[6]

2. Relevance of a conceptual framework for social and demographic statistics

At its 55th session, the Statistical Commission entrusted the Friends of the Chair group with advancing research on an overarching conceptual framework for social and demographic statistics, as outlined in decision 55/111. This task aligns with the group's mandate to formulate strategic recommendations for strengthening social and demographic statistics, to better reflect society and its connections with the economy and the environment.

The 2023 mapping exercise conducted by the Friends of the Chair group highlighted the extensive range of methodological tools available within this statistical pillar, spanning numerous subdomains with associated theoretical traditions, practical applications, and data user communities.. However, despite clear interconnections among these areas, the development of social and demographic statistics has often occurred in silos, resulting in fragmented frameworks and data infrastructures, limiting the capacity for integrated, cross-cutting analysis. Addressing this fragmentation requires strengthening coordination across domains and across all stages of the statistical process - from data collection to dissemination, and analysis. Such efforts

[3] UNSD. The Sustainable Development Goals Report – 2024 [online: https://unstats.un.org/sdgs/report/2024/The-Sustainable-Development-Goals-Report-2024.pdf]

[4] United Nations Statistical Commission (2022). Report on the fifty-second session [online: https://unstats.un.org/UNSDWebsite/statcom/session_52/documents/2021-30-FinalReport-E.pdf]

[5] United Nations Statistical Commission (2024). Report on the fifty-fifth session [online: https://unstats.un.org/UNSDWebsite/statcom/session_55/documents/2024-36-FinalReport-E.pdf]

[6] United Nations (2024). Pact for the Future, Global Digital Compact and Declaration on Future Generations [online: https://www.un.org/sites/un2.un.org/files/sotf-pact_for_the_future_adopted.pdf]

must build on sound methodological foundations, including harmonized concepts, consistent definitions and internationally agreed classifications, to enhance the coherence and relevance of social statistics.

While no internationally agreed-upon conceptual logic currently exists to coherently unify the diverse sub-domains within the social and demographic statistical pillar, the call for such a framework reflects a longstanding need to conceptualize and systematize this wide statistical space[7]. Additionally, the increasing demand for inclusive, agile, and fit-for-purpose statistical systems—capable of accurately capturing well-being within and across societies and monitoring progress toward inclusive and sustainable development in line with the 2030 Agenda—has amplified this need. Coupled with the opportunities presented by emerging digital technologies, these developments create the momentum required to advance an overarching conceptual framework for social and demographic statistics.

A well-defined conceptual framework is crucial for building an integrated sociodemographic data system by providing a coherent structure that aligns concepts, definitions, standards, and methodologies enhancing data integration, reducing duplication, and improving the timeliness and accuracy of insights for effective policymaking.

A conceptual framework would foster a more systematic and integrated approach, enabling the production of robust, policy-relevant statistics that better capture the interconnected and multidimensional aspects of people's lives. This approach would empower data producers and users to identify meaningful patterns and relationships across social subdomains. The development of an accompanying integrated social and demographic data infrastructure would further provide a consistent, agile, and detailed solution to data production, analysis, and use. While still aspirational, these steps would enhance the horizontal integration of social, economic, and environmental data, supporting a holistic measurement of progress. By leveraging granular and geocoded information, it would be possible to gather comprehensive, intersectional, and location-based insights, helping to identify synergies across key dimensions of sustainable development. This would contribute to a clearer understanding of multi-dimensional well-being and progress beyond GDP, monitoring SDG progress, and supporting evidence-based policies aligned with the actions of the Pact of the Future.

The Friends of the Chair group has stressed the importance of a flexible and inclusive approach to improving social and demographic statistics, one that considers diverse national contexts and statistical capacities. The conceptual framework is envisioned by the Friends of the Chair group, as a guiding blueprint for continuous improvement, supporting national statistical offices in building a progressively adaptable and ambitious system for social and demographic statistics. This ideal system will capture population characteristics and relationships, offer further detailed data disaggregation, respond to societal changes across relevant subdomains of well-being over time, and ensure frequent data collection, compilation and dissemination to enable timely and broad use in shaping national and global policies. By minimizing duplication, this approach would elevate social and demographic statistics alongside economic and environmental data in decision-making processes. Achieving this vision, however, requires time and resources, allowing countries to progress at their own pace according to national priorities and the current state of their statistical systems.

B. What are the building blocks of social and demographic statistics?

In the Report of the Friends of the Chair group on Social and Demographic Statistics to the 55th session of the Statistical Commission, the Group identified key building blocks—people, relationships, places, time, and outcomes[8]—that are common across National Statistical Offices and thus can serve as a foundational role in strengthening integration within the social and demographic statistics pillar.

[7] For an overview of the discussions held and decisions taken by the Statistical Commission on social and demographic statistics since 1947 including the work Towards a System of Social and Demographic Statistics published in 1975, see the fifty-fifth session Statistical Commission Report of the Friends of the Chair group on social and demographic statistics, Annex 5.

[8] In 2024, the Group conducted an in-depth exploration of four building blocks: People, Relationships, Places, and Time. The building block "Outcomes" is depicted with dashed borders in the diagrams to signify that it has not yet been thoroughly examined.

TIME

Repeated observations over time aid in understanding and anticipating changes in population, distribution, outcomes, and relationships.

Organising element linking people, relationships, outcomes, and places while revealing dynamics across historical, life-course, and generational scales.

Relevance:

Time as a variable or measured time
Discrete intervals—minutes, days, or years—used to analyse life events, relationships, and social outcomes, bridging the fluidity of real life with statistical observation through like life-course and time-use analysis.

Time as an approach or contextual time: Powerful lens for understanding the interconnectedness of social, demographic, environmental, and economic phenomena, emphasizing temporal dynamics across multiple scales: historical, individual, and intergenerational.

Time as a system or data production time
Focuses on statistical processes and outputs, emphasizing timeliness, frequency, and relevance to adapt to societal changes. It ensures data is produced and disseminated promptly to remain meaningful and actionable.

Relationships evolve over time, with temporal data revealing shifts in intergenerational dependencies, caregiving, and the impact of events like marriage, divorce, or migration on relational structures. Temporal data helps illuminate the shifting quality and function of relationships, critical for understanding well-being and societal resilience.

RELATIONSHIPS

Interactions between individuals which collectively build up the fabric of a society

Multilevel and multidimensional

Dimensions	Levels
• Extent • Function • Quality • Impact	• Micro (*Individual, household, family*) • Meso (*Community, Sector/Institutions*) • Macro (*Society, national and global*)

Relevance:
- Fundamental aspect of human experience, shaping society through diverse connections that range from close family bonds to broader societal institutions.
- Relationships support positive outcomes in health, life expectancy, education, and employment and hold intrinsic value, enriching well-being by fostering respect, empathy, and belonging.
- Comprehensive measurement approaches become essential to understanding how evolving family dynamics, caregiving roles, and urbanization reshape social interactions.

People's connections shape social life, with events like births, deaths, and migration influencing relationships.

PEOPLE

The object, and 'unit of measurement' for social and demographic statistics.

Population stocks | Population flows | Population characteristics

Strengthening population data systems
Regularly updated and designed to incorporate essential population characteristics, enabling detailed data disaggregation by age, sex, geography, and other relevant factors

Relevance:
- Understanding demographic trends, drivers, and consequences for population groups.
- Showcasing interactions among demographic events and environmental, economic, cultural, and political systems.
- Effective resource allocation and policy formulation
- Producing accurate population estimates that serve as denominators for various indicators across the three dimensions of sustainable development.
- Monitoring progress toward the Sustainable Development Goals.

Time offers a longitudinal view of demographic trends (e.g. ageing, migration, fertility), tracking changes across life stages and informing resource allocation, policy, and planning.

Time helps analyze life-course outcomes, revealing disparities and guiding long-term policy interventions.

Places shape community relationships, with geographic segregation and clustering influencing family arrangements, segregation, and neighborhood connections

Geospatial information acts as a crucial connector, enabling the integration of diverse datasets to improve population estimates.

OUTCOMES

Individual and societal conditions assessed through both objective and subjective measures.

Relevance:
- Social statistics focus on measuring various aspects of well-being to guide public policies, programs, and services aimed at improving outcomes.
- Well-being metrics receive considerable attention from decision-makers, the media, and the public, highlighting the social dimension alongside economic and environmental factors. These metrics offer a multidimensional perspective, capturing people's ability to meet basic needs, achieve personal goals, and experience life satisfaction.
- Tracking social outcomes across diverse population groups, relationships, time periods, and locations uncovers patterns of social and intergenerational inequalities. This insight provides a vital foundation for developing targeted and effective policies.

Social outcomes reflect the essential results of human experience, encompassing both fundamental survival needs—such as access to food, water, and shelter—and broader living standards that go beyond subsistence.

Geographic factors impact where people live, work, and access resources, influencing mobility and inequality.

PLACES

Geography is essential to understanding social and demographic issues, anchoring human events and relationships within specific territories and regions.

Integration of socio-demographic and geospatial information

Relevance:

Enhances production of social and demographic statistics
Integrating geospatial information with censuses, surveys, and administrative records enhances the accuracy, granularity, and utility of statistical data through geocoding, indicator development, and improved design and implementation processes.

Links within and across statistical pillars
Geography connects sociodemographic statistics with other statistical domains, enabling integrated analyses and linking diverse data sources, such as censuses and administrative records, through their location and is also critical for dissemination.

Determinant of social outcomes
Space can be a determinant of social outcomes, as geography can influence proximity to resources, standards of living, exposure to hazards and risk factors, and accessibility to infrastructure

Building blocks of social and demographic statistics

PEOPLE

People are the core unit of social and demographic statistics, making data on their quantity, characteristics, vital events, and movements fundamental. Social statistics provide evidence that places individuals—reflecting diverse characteristics and intersectional perspectives—at the heart of policy-making. It is crucial to strengthen population data systems to understand demographic trends, such as migration and aging, along with their drivers and consequences as well as to examine how non-demographic factors—like environmental, economic, cultural, and political systems—interact with demographic events for a more comprehensive analysis. These insights support effective resource allocation, policy development, and monitoring progress toward the Sustainable Development Goals. Population data systems must be regularly updated to reflect current realities, with disaggregated data by age, sex, geography, and other factors to address disparities.

RELATIONSHIPS

Relationships shape society through connections, from family bonds to societal institutions. Individuals are embedded in families, households, communities, and institutions, forming the social fabric. These relationships are multi-level (micro, meso, macro) and multi-dimensional, as their extent, function, quality, and impact influence well-being at individual, community, and societal levels. They support positive outcomes in health, education, and employment, while also holding intrinsic value enriching well-being through respect, empathy, and belonging. As family dynamics, caregiving roles, and urbanization evolve, comprehensive measurement of both the quantity and quality of relationships is crucial for understanding well-being. This complexity requires a nuanced statistical framework that views relationships as both an outcome and determinant in social and demographic statistics across contexts and population groups.

Knitting elements

PLACES and TIME reveal how people's characteristics, vital events, movements, relationships and outcomes vary over time and location

PLACES

Places are crucial for understanding social and demographic issues, anchoring human events and relationships in specific regions. Integrating geospatial data into statistical frameworks allows for accurate measurement and analysis of phenomena in their geographic context, informing policy on inequality, migration, economic opportunity, and social mobility. To analyze sociodemographic patterns, data must be georeferenced, linking statistics to locations, whether aggregated or at the individual level. Georeferenced data enables a holistic approach by integrating diverse sources from different statistical domains for comprehensive analysis. This integration requires assessing compatibility across statistical processes to ensure coherence, establishing robust systems and linkages for seamless interoperability. This enhances the quality and accuracy of sociodemographic statistics, supporting national statistical systems in addressing place-based policy needs.

TIME

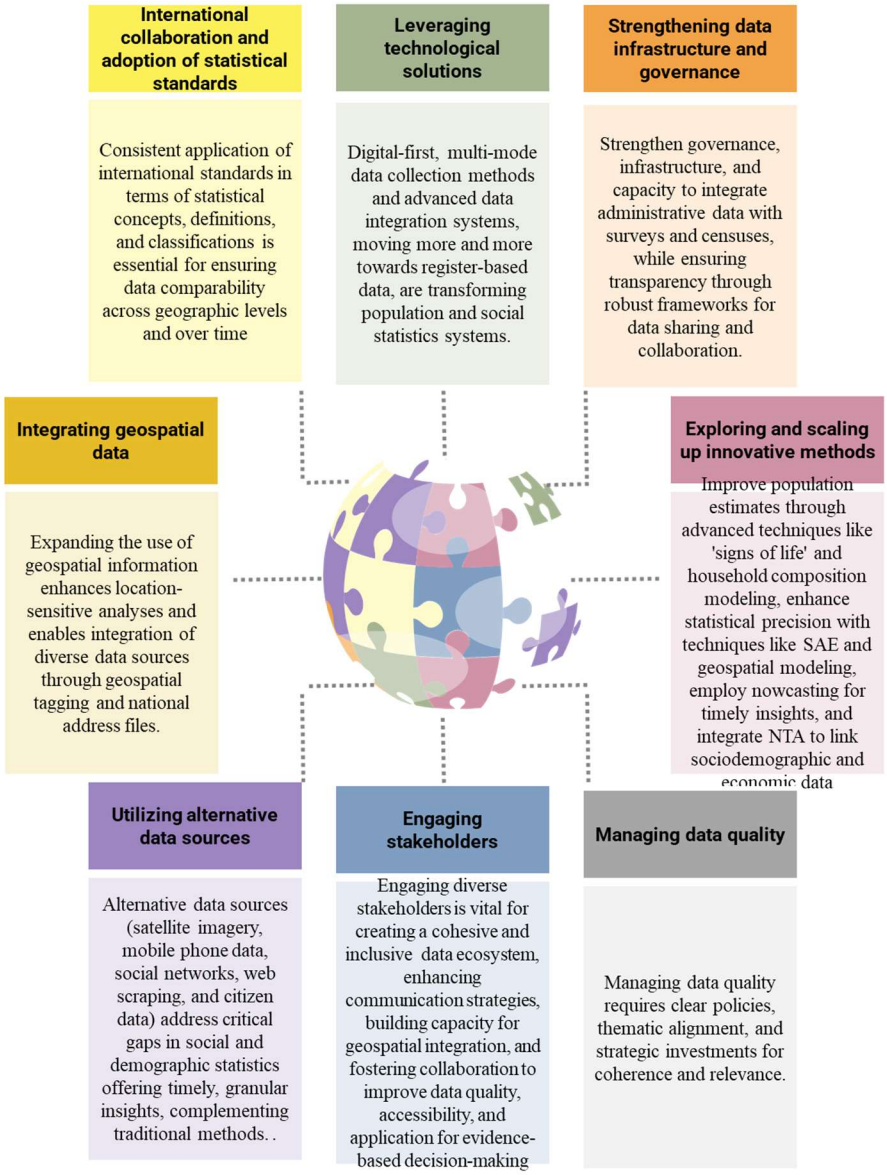
Time is crucial for understanding changes in individual traits and relationships throughout life. It helps measure how connections evolve, influenced by factors like family dynamics, ageing, and social roles. Time enables trend analysis and anticipates societal needs. Life-course approaches highlight the interconnectedness of experiences across stages with longitudinal data providing key insights into intergenerational inequality, health, migration, and social mobility, offering a deeper understanding of well-being. Time-use data also reveals how individuals allocate their time, offering a nuanced view of life quality beyond economic indicators.

C. What are the current challenges faced by the building blocks of social and demographic statistics?

The production and use of social and demographic statistics face several interconnected challenges. The initial findings from the ongoing research on a conceptual framework for social and demographic statistics highlight that the lack of cohesive integration of social data has historically hindered progress, as social statistics have tended to favour a detailed focus within thematic areas and/or population sub-groups. The social pillar of statistics covers a wide range of disciplines, including demography, public health, criminology, labour market economics, sociology, and more. Similar concepts are often approached from different perspectives, and the absence of a shared taxonomy or an overarching framework explaining the interactions between thematic domains have been a key challenge. The inherent complexity of the social statistics pillar means that advancing a coherent conceptual framework will require time, efforts, and significant resources. The challenges outlined below stem from research findings and insights gained during the 2024 Sprints organized by the Group.

D. How to advance towards a more integrated system of social and demographic statistics?

Once the overarching conceptual framework has been developed, national statistical offices are encouraged to approach the development of social and demographic statistical systems incrementally, focusing on greater integration and efficiency. This continuous improvement can help track social outcomes more effectively, optimize resource management, and provide policymakers with insights to address evolving challenges. Quality is fundamental to any statistical system, with data integration and quality mutually reinforcing each other. Timely sociodemographic data is essential for effective interventions, and innovative approaches like nowcasting and technology can improve data relevance and accessibility to address policy gaps and ensure targeted services for those in need. Leveraging advancements in technology, geospatial integration, and modelling techniques can address data gaps and improve quality. Achieving finer data disaggregation provides valuable insights but requires careful privacy management. A balanced approach that integrates diverse data sources, robust methodologies, and innovation, while adhering to international standards, supports a strong, integrated system. Active experimentation and stakeholder engagement further strengthen the system.



International collaboration and adoption of statistical standards	The consistent use of international standards for statistical concepts, definitions, and classifications ensures data comparability across population groups, locations, and over time. UN frameworks like the Principles and Recommendations for Population and Housing Censuses and the Recommendations on Statistics for International Migration guide NSOs in improving data coverage, accuracy, and granularity. Standardizing definitions for social groupings, such as households and families, enhances dataset integration, while further efforts are needed to capture the complexity of social relationships. Standards like the DEGURBA and GSGF support linking sociodemographic data to geographic levels, enabling precise, place-based policies. The adoption of common geographies for data dissemination enables more meaningful interpretations. International cooperation is also key to share best practices, align methodologies (e.g., NTA, NTTA) and build capacity to ensure more consistent and reliable social and demographic statistics. Similarly, the Generic Statistical Business Process Model (GSBPM) is an international standard that can be used to describe statistics production in a general and process-oriented way.
Leveraging technological solutions	Digital-first, multi-mode data collection methods combined with advanced data integration systems, and an increasing shift toward register-based data, are transforming population and social statistics systems. These technologies enable real-time monitoring of data collection, facilitate early detection of anomalies, and support timely corrective actions. This ultimately enhances the accuracy, timeliness, and reliability of social and demographic statistics while addressing gaps and biases affecting underrepresented groups. It is crucial to secure long-term funding for modernizing data collection and analysis infrastructure, prioritizing technology that supports real-time updates while maintaining historical continuity.
Strengthening data infrastructure and governance	As countries integrate administrative data with survey and census sources, strengthening data governance and infrastructure is essential. While full register-based systems may not suit all contexts, leveraging administrative data can address gaps, enhance coherence, and produce reliable population estimates. Key actions include building statistical capacity, reskilling personnel, and linking data sources. Countries should also establish governance frameworks, robust business processes, and mechanisms for data sharing and dissemination to ensure transparency and accountability. Ethical frameworks prioritizing data protection and anonymization, alongside clear public communication, are crucial for building trust in longitudinal data use.
Integrating geospatial data	Countries are encouraged to adopt emerging technologies and innovative methods, incorporating the GSGF into their statistical and geospatial systems. Investments in technology, GIS software, and capacity-building for geospatial and statistical analysis are crucial, alongside exploring privacy-protective solutions that maintain data utility. A geocoded national address file can significantly enhance data integration, creating a comprehensive geographic framework for social statistics. Leveraging growing data availability and advanced computational techniques, such as modelling, can improve spatial estimations while ensuring rigorous quality assessments to maintain reliability across geographic levels.
Managing data quality	Managing data quality requires clear policies for adopting new definitions and classifications while maintaining historical coherence, ensuring methodological rigor, and securing public acceptability. Aligning revisions, updates, and data collection methods across themes enhances coherence and supports international comparability. To ensure relevance, societal and policy factors, such as gender norms and economic systems, should complement individual-level data for a comprehensive understanding of population dynamics. Strategic investments in data systems are crucial, prioritizing key indicators that require frequent measurement and allocating resources for regular, high-quality data collection. Long-term investments in life course research should balance immediate needs with sustainable knowledge generation for future policy development.

Exploring and scaling up innovative methods	Improving population estimates from administrative records involves applying decision rules, such as the 'signs of life' approach, to include only individuals meeting usual residence criteria and reduce over-coverage. Countries also use methodologies to identify connections between individuals for better household composition estimates. Modelling techniques, like Small Area Estimation (SAE), enhance the accuracy and granularity of social statistics by combining diverse data sources, addressing challenges from limited survey samples and declining response rates. Nowcasting methods provide timely data estimates for urgent decision-making. National Transfer Accounts (NTAs) link sociodemographic and economic data, illustrating resource redistribution across age groups and informing policies on ageing and resource allocation. Adding time-use data to NTAs supports gender analysis by highlighting unpaid household services often excluded from national accounts.
Utilizing alternative data sources	Alternative data sources can fill critical gaps in social and demographic statistics, meeting the demand for timely, granular, and dynamic information. Satellite imagery enables detailed population distribution estimates, land use tracking, and proximity analysis for services like schools and healthcare. Mobile phone data provides near real-time insights into population mobility and migration patterns, while social network datasets offer nuanced analyses of community connectivity and social structures, requiring strong privacy frameworks. Web-scraped data cost-effectively captures public sentiment and social trends, and citizen data adds grassroots perspectives, particularly on hard-to-measure topics like violence against women. These sources collectively enhance the quality and relevance of social and demographic statistics.
Engaging stakeholders	Engaging stakeholders across the data ecosystem, including policymakers, media, and the public, fosters a cohesive and inclusive data environment. While NSOs lead in producing social and demographic statistics, collaboration with civil society, academia, and the private sector addresses diverse information needs. Academia, for instance, often conducts in-depth quantitative research. Strengthen the analytical skills of statisticians and economists through training in advanced techniques like structural equation modelling and data linkage. Provide documentation, training resources, and promote regular interactions between researchers and data custodians to support longitudinal data use. Multidisciplinary teams enhance integration, leverage expertise, and improve data quality, while partnerships and governance build trust, enabling evidence-based decisions and securing resources. Enhancing communication strategies and capacity for integrating sociodemographic and geographic data is vital. Geospatial visualizations, such as dashboards and geo-visual frameworks, simplify complex datasets, aiding policymaking and emphasizing geographic insights. Visualization tools and accessible narratives promote understanding and informed decision-making. Engaging data users throughout the value chain ensures alignment with objectives, fostering targeted initiatives. Comprehensive metadata enhances transparency, while collaboration among governments, researchers, and civil society improves data accessibility. Encouraging researchers to explore longitudinal data and fostering regular interactions enriches the data landscape, supporting effective use of sociodemographic information. A standardized process model could be developed to outline the outline the key stages for stakeholder engagement, identifying critical points in a project where NSOs can involve stakeholders to enhance the development and relevance of statistics.

E. Next steps of the Group

In their last year of mandate, the Friends of the Chair group is planning to continue research on the potential of the four building blocks —**people, relationships, place, and time**— as the new lens to better organize, harmonize and integrate data for social and demographic **outcomes**. This work aims to identify **strategic recommendations** to advance the development of a cohesive conceptual framework and supporting data infrastructure for social and demographic statistics. In particular, a core group of members within the Friends of the Chair group will advance research on the overarching conceptual framework and document their findings in a draft report.

II. In-depth research of the key building blocks to organize social and demographic statistics, (findings as of December 2024)

A. People[9]

1. Introduction

People are the main unit of measurement for social and demographic statistics, making data on their quantity, characteristics, vital events, and movements essential. Social statistics are inherently people-centric, and enhanced social statistics should aim to provide evidence that places individuals—reflecting diverse characteristics and intersectional perspectives—at the heart of policy-making. In this context, the Friends of the Chair group has emphasized the critical need to strengthen population data systems to better understand demographic trends, such as migration and population ageing, as well as their drivers and consequences for different population groups.

Population data systems draw from diverse data sources, including censuses, surveys, administrative records, geospatial data, and alternative data sources. A robust population data system can generate annual estimates of population stocks and flows by sex, age, small area, and population subgroups, enabling continuous monitoring of dynamics such as migration, urbanization, ageing, inequality, and subnational progress on Sustainable Development Goals (SDGs). These systems are vital for guiding policy and decision-making, tracking population trends, highlighting disparities, evaluating programme effectiveness, and fostering research and innovation. In addition, population data systems support the production of demographic and satellite accounts, covering topics like household composition, and populations defined by criteria beyond the usual residence, such as daytime or seasonal populations. They also facilitate the creation of synthetic datasets, allowing researchers to analyse sensitive population data without compromising individual privacy. To meet the evolving needs of population data and potential disruptions, modern data systems must be resilient and adaptable.

This section addresses key questions, including: How can social and demographic statistics systems be enhanced by strengthening the population data spine? How can the consistency and timeliness of population estimates be improved? How can administrative records (e.g., health, education, tax data) supplement census data to enhance the timeliness, cost efficiency, and accuracy of population estimates? What statistical models can be used to address data gaps and improve demographic statistics?

i. Why do population data systems matter?

Population data systems play an essential role in understanding demographic changes, including births, deaths, and migration. These data systems help to create population estimates, which are crucial for policy development, especially in areas such as health, education, and social services. In addition to supporting public sector initiatives, population data is also key for the private sector, enabling businesses to identify consumer demographics and tailor products and services to meet market demands. Every statistical insight and decision-making process in fields such as public policy, healthcare, education, and business begins with accurate and thorough information about individuals and communities. Without accurate and timely data, governments, international organizations, and private enterprises cannot properly monitor and assess progress toward development goals or market trends. Population estimates rely on a combination of different demographic factors, such as birth rates, death rates, and migration patterns. By understanding how these factors interact, governments, organizations, and businesses can create accurate projections that inform policies, resource distribution, service delivery, and market strategies.

Countries use different types of population data systems[10] based on their primary data sources. These systems can be categorized into three main groups:

[9] The task team working on the in-depth research of the building block PEOPLE was composed of members from Statistics Lithuania, the National Institute of Statistics of Uruguay, the United Nations Population Division, and the United Nations Statistics Division.

[10] See more details on Annex A.1

1. **Full Field-Based Census Systems:**

   These countries rely on periodic and complete field enumeration of the population, typically conducted every 5-10 years. Although censuses can provide accurate and detailed demographic data when executed properly, they are costly, labour-intensive, infrequent and often become outdated between enumeration periods, especially in regions experiencing rapid population changes. Many countries, in particular those with less developed administrative systems, rely heavily on this approach as their primary source of population data because of the lack of alternative data sources. As of December 2024, 69% of countries have conducted a full field enumeration census for the 2020 census round.[11]

2. **Register-Based Systems:**

   These systems use continuously updated population registers that record vital events such as births, deaths, and migration. By linking these records to administrative databases, such as health, education, and social security data, register-based systems provide a continuous stream of population data. Countries with advanced administrative and statistical infrastructure and strong legal frameworks for data governance and privacy, such as Northern Europe and parts of Asia, primarily use these systems. For the 2020 census round, only 12% of countries relied solely on administrative registers for their census. Register-based systems provide timely and regular demographic updates and offer high accuracy when records are well maintained. However, systems based on administrative data also face significant challenges. These include limitations in scope and definitions, as administrative data are designed for specific purposes other than official statistics, potentially undermining comparability with traditional censuses and international standards. Additionally, issues like delayed updates, over-coverage, under-coverage, and quality problems of the data, linkages, and processing (e.g., errors, omissions, or implausible records) can affect the reliability and completeness of population estimates.

Box 1: Estonia – Administrative-based census

In 2021, Statistics Estonia conducted its first fully administrative data-based census, marking a significant shift from traditional census methods to reliance on administrative data sources. A major challenge faced during this process was defining the base population, which Eurostat describes as individuals residing in the country for the majority of a 12-month reference period. Estonia's population registry, managed by the Ministry of Interior, is of high quality but records only the legal population. Due to the ease of mobility within the EU, many residents fail to update their migration status in the registry. To address this, Statistics Estonia utilized multiple administrative data sources to identify individuals who were active in the country during the reference year. Thanks to the Statistics Law, Statistics Estonia has access to these registers, enabling the use of diverse data for this purpose.

Since 2016, all administrative registers in Estonia have been linked through personal ID codes, allowing for the comprehensive integration of various data sources. To define the base population, in addition to the population registry, other administrative records were examined for "signs of life," such as employment, school enrolment, and receipt of social benefits. A total of 35 signs were weighted, and likelihood scores were applied to determine whether an individual belonged to the base population.

Similarly, defining households presented challenges, as many families were registered at different addresses in the Population Registry. Administrative data was used to develop a methodology for identifying relationships between individuals (e.g., marriage) and determining their most probable shared address. Looking ahead, Statistics Estonia plans to integrate more data into its models and provide feedback to administrative data providers to enhance data quality. The long-term objective is to rely on a single data source, eliminating the need for complex modelling in the future.

Source: Presentation by Ms. Terje Trasberg, Team lead of population and education statistics, Statistics Estonia during the webinar *Building modern and resilient population data systems to enhance data quality, improve cost efficiency and policy relevance*

[11] See more details on the Report on the results of the third UNSD survey on the 2020 round of population and housing censuses and analysis of census topics.

3. **Combined Systems:**
   A growing number of countries are adopting combined systems that integrate census, survey, and administrative data such as social security records, health, and tax data. For the 2020 census round, 18% of countries relied on combined methods for their census. This approach is becoming more common in countries with advanced administrative capabilities and offers improved cost efficiency and timeliness compared with traditional censuses. It also helps improve the granularity of the data, particularly when linked with other sources.

Box 2: New Zealand – Combined census

In 2018, New Zealand experienced historically low census response rates, necessitating a shift from traditional imputation methods to incorporating administrative data into the census. This rapid adaptation involved statistical linking of collected census data with administrative records to complete the census file. While this approach allowed the census to proceed, it was not part of the original plan, which led to scepticism about the results and concerns regarding the quality of the data. Additionally, public understanding of the social license to use administrative data in this way posed challenges.

The process revealed several key difficulties. Public perception was impacted by the sudden introduction of administrative data, with some viewing it as a measure to "solve a crisis." There were concerns about data quality and the appropriateness of using administrative data for census purposes. The lack of unique identifiers required statistical matching between administrative records and census data, leading to allowances for missed links and the random deletion of records to maintain reasonable coverage. The new approach also introduced errors not typically seen in traditional censuses, such as missing address information, which required significant communication efforts with users. Furthermore, variable quality across the dataset, with some variables based on high-quality administrative data and others affected by low response rates, highlighted the need for detailed clarification to users. To address these challenges, New Zealand implemented quality assurance mechanisms, including an external review process for transparency and a variable quality rating system to help users assess data reliability.

By 2023, New Zealand conducted another census using the same model, which proceeded more smoothly. The population counts were recently released and generally accepted, demonstrating that the integration of administrative and census data likely improved population estimates.

Source: Presentation by Mr. Vince Galvin, Chief Methodologist at Statistical Methodology Branch, Statistics New Zealand during the webinar *Building modern and resilient population data systems to enhance data quality, improve cost efficiency and policy relevance*

ii. Data sources for population estimates

Population data sources vary significantly between countries in terms of availability, quality, and completeness. These sources include:

- **Population censuses:** These are conducted by most countries with varying coverage, frequency, and quality, and provide the baseline population data necessary for calculating intercensal and post-censal population estimates. These calculations also incorporate estimates of births, deaths, internal and international migration, assumptions about future trends, and adjustments for specific subgroups, such as age groups.
- **Civil registration systems (CRS) and vital statistics:** Birth and death registration systems also vary in completeness, ranging from less than 50% to over 90% globally.
- **Migration data:** Migration statistics are often the weakest component because of inconsistent data collection methods.

- **Population registers:** Some countries have well-established registers, while others are still developing them. The absence of metadata may significantly hinder assessing the completeness of these registers.
- **Administrative data:** Increasingly, countries are turning to administrative records to supplement other data sources, but challenges remain regarding access, interoperability and quality.
- **Sample Surveys:** When other sources are unavailable, sample surveys can provide valuable information, although their coverage and frequency can be limited.

iii. Methods for deriving population estimates

Countries relying on up-to-date population registers or combined systems integrating births, deaths, and migrations in a timely manner can use these individual-level data to produce population counts for various population characteristics, geographical levels, and points in time. For other countries that rely on full-field enumeration censuses, population estimates must be continuously updated between censuses. Two main types of estimates are used to ensure up-to-date population figures:

- **Intercensal Estimates:** These use data from the most recent censuses, combined with birth, death, and migration data. Intercensal estimates are crucial for maintaining up-to-date figures and ensuring internal consistency. The demographic balancing equation — calculating the population at a given time by accounting for natural change (births minus deaths) and net migration (immigrants minus emigrants) — is fundamental to this process.
- **Post-Censal Estimates:** After a census, post-censal estimates adjust the population figures to correct for inaccuracies, such as undercounts or overcounts, and update the base population figures for population dynamics. Post-censal estimates use the demographic balancing equation to project figures, providing updates after a census or annually, which are crucial for ensuring that population data remain accurate over time, especially when significant demographic changes occur.

The **cohort-component method** is widely used for both intercensal and post-censal estimates. This method projects population changes by age and cohort, incorporating data on fertility, mortality, and migration to estimate future population trends.

iv. Importance of the base population in population estimates

The base population serves as the starting point for all population estimates and projections, making it one of the most critical components in population data systems for producing reliable population estimates and projections. The base population represents the size and structure of the population at a specific point in time. An accurate base population ensures that subsequent estimates reflect true demographic dynamics, including births, deaths, and migration, which are key inputs into demographic models such as the cohort-component method. However, if the base population is inaccurate owing to under-enumeration or outdated information, it can lead to errors in population estimates, affecting policy decisions and resource allocations.

Box 3: Population Bases

The production of population statistics involves a wide range of national and international concepts, such as "registered population," "official population," "non-usual residents," "usual residents," "legal residents," "current population," or "base population." The variations of these concepts across countries may stem from several factors such as:

- Legal frameworks for the production of official statistics, including the registration of vital events or migrations.
- Existence of coordinated data governance and the extent of institutional cooperation required to produce statistics from multiple data sources.
- Siloed population data systems using different population bases across domains

To address this challenge, there is a pressing need to unify definitions and conduct in-depth analyses of existing concepts. This would help identify gaps between national and international definitions and clarify whether adjustments or estimates are needed to harmonize data. Moreover, multiple definitions of

population statistics may need to coexist to meet the diverse needs of users and purposes. For instance, distinguishing between usual and non-usual residents is critical for analysing healthcare service usage or capturing population groups present at specific times.

Recent global challenges, such as the COVID-19 pandemic, energy crises, and other emergencies, have underscored the need for more detailed and flexible population data. These challenges highlight the importance of developing alternative population concepts or "population bases" beyond traditional measures like the registered or usual resident population. For example, incorporating the workplace population—representing individuals present in a location during workdays—can enhance emergency preparedness and policymaking. This broader perspective enables better response strategies and more effective planning for both residents and transient populations.

Standardizing population concepts and adapting to emerging demands requires collaborative efforts to harmonize definitions while accommodating the specific needs of countries and users. Clear conceptualization and flexibility will be essential for building robust, comparable, and actionable population statistics systems.

Most countries depend on population and housing censuses to establish their base population. Censuses provide comprehensive data on demographic characteristics and serve as benchmarks against which other data sources are measured. In the absence of frequent or reliable census data, countries face challenges in maintaining accurate population estimates.

Given the centrality of the census in producing population estimates, it is crucial that census data be thoroughly evaluated and, if necessary, adjusted before use as a base for estimates and projections. Census evaluation involves assessing the accuracy and completeness of the data collected during the census, including checking for under-enumeration, over-enumeration, and errors in age- or sex-reporting. These evaluations are particularly important in regions where census coverage may be incomplete, or where certain populations are difficult to enumerate.

Several methods are employed to evaluate census data such as:

- **Post-Enumeration Surveys (PES)**: Conducted after a census, PES assesses data quality by comparing census results with independent surveys and identifying undercounts or overcounts.
- **Administrative Data Comparison**: Census data are cross-checked against administrative records (e.g., birth and death registrations, immunization records, school enrolment, voter registration, and social benefit data which are used as proxies for specific age groups) to identify discrepancies. In countries with population registers, census results can be cross-checked against the register data to ensure consistency.
- **Demographic analysis:** New census data can be compared to the results from the previous census and other demographic data for the most recent intercensal period using demographic accounting to track population changes over time by age and birth cohort.

Adjustments may involve correcting population counts for specific age or sex groups or accounting for geographic under- or over-representation. These processes ensure that the base population used in estimates is as accurate as possible.

v. Consistency and timeliness in population estimates

Countries may integrate various data sources, such as census, surveys, and administrative data -including population registers- as well as alternative data sources to produce consistent and timely population estimates. Several methods exist for estimating annual population:

- **Continuously Updated Population Registers:** These provide the most up-to-date data, ensuring high consistency by age, sex, and cohort.
- **Cohort-Component Method:** This method applies demographic models to census data and provides estimates consistent by age, sex, and cohort.

However, not all countries have reliable or consistent methods. Some countries do not adjust census data for under-coverage stemming from under-enumeration or under-reporting, which leads to discrepancies between the national and international estimates.

Box 4: The Role of International Population Estimates and Projections

The **World Population Prospects (WPP)** produced by the Population Division of DESA every two years complement national population estimates and projections and provide a comprehensive and standardized demographic dataset for all countries and areas from 1950 to the present and long-term projections up to 2100. It plays a critical role in ensuring consistency in population estimates (and in projection methods and assumptions), which are essential for global monitoring. WPP estimates are based on existing population census counts (upon evaluation and potential adjustments following a standard analytical protocol) and components of population change (births, deaths, and migration) and are used as a benchmark for national population estimates. Each new revision reassesses past demographic levels and trends using a common set of analytical steps and methods based on all publicly available data, including the latest available new census, survey, and vital registration information.

International organizations often rely on the WPP as a "denominator" for various SDG indicators, emphasizing the importance of accurate population sizes for the computation of derived estimates, including regional aggregates.

Source: Presentation by Mr. Patrick Gerland, Chief, Population Estimates and Projections Section, UNPD during the webinar *Building modern and resilient population data systems to enhance data quality, improve cost efficiency and policy relevance*

vi. Defining population accounts

One of the critical tasks in building modern population data systems is defining population accounts that align with the demographic estimation methods for fertility, mortality, and migration. This involves creating international standards and statistical methodologies to reconcile data from diverse sources and to produce timely, consistent population estimates based on the latest population counts used as baseline and upon evaluation.

- *Producing Consistent Estimates*: By adhering to international standards and utilizing advanced demographic estimation methods, countries can ensure that their population estimates are accurate, timely, and relevant to policy development.
- *Fertility and Mortality Estimates*: Countries are encouraged to utilize national civil registration and vital statistics (CRVS) systems, which provide comprehensive data on births and deaths. However, in many countries, these systems are incomplete or outdated and require adjustments through sample surveys or censuses. Direct and indirect estimation methods can be combined to provide more comprehensive levels and trends.
- *Migration Estimates*: Migration data are often the weakest link in population estimates, as many countries lack comprehensive systems for tracking emigration and immigration. The United Nations methodology incorporates new probabilistic models to project net migration and model-based patterns by age and sex, which provides a more accurate reflection of migration patterns.
- *Reconciling Diverse Sources:* Producing reliable population estimates requires the integration of data from multiple sources including censuses, surveys, administrative data, and in rare cases alternative data sources. To reconcile discrepancies between these sources, countries should build on established statistical and demographic methods to adjust their estimates based on known demographic patterns and international benchmarks, especially for neonatal, infant, and child mortality as well as adult and old-age mortality.

vii. Population projections

Population projections are estimates of future population size and structure based on current demographic trends such as fertility rates, mortality rates, and migration patterns. By providing insights into potential changes in age distribution, population density, and overall size, projections help policymakers and planners anticipate future needs and allocate resources effectively.

It should be noted that population projections differ from population estimates. While population estimates aim to measure the current population size, population projections focus on the future. Population projections use mathematical models to predict population size and structure at a future point in time, based on assumptions about trends in fertility, mortality, and migration. The reliance on assumptions in projections highlights the need to interpret them differently from estimates, recognizing their inherent uncertainty and forward-looking nature.

However, it's crucial to note that projections are not predictions, and their accuracy depends on the validity of the baseline population and underlying assumptions about future demographic trends, which can be influenced by unforeseen events such as pandemics or economic shifts.

viii. New demands for integrated population data systems and data governance

Population data systems must be designed to be resilient and adaptable to evolving demands over time. This flexibility is critical in addressing the diverse challenges and requirements of data users, particularly those seeking accurate population counts for a specific territory on a given date. Developing integrated population data systems requires careful consideration of the policy relevance of the data produced. Systems that integrate multiple data sources and leverage innovative methods and techniques are better equipped to meet a broad range of needs effectively.

2. Challenges

Several challenges affect the production and use of population data:

i. Recognition and use of population data

The recognition and use of demographic data face several challenges that hinder its full potential. Policymakers often underestimate the importance of population data, focusing on short-term priorities while overlooking critical long-term demographic changes, such as population aging. Financial constraints further exacerbate these challenges, particularly in funding field-based census operations, which are still vital for producing accurate population estimates in 69% of countries in the world. In many countries, the lack of specialized teams dedicated to population estimates and projections further limits the effective use of demographic data.

Additionally, issues of misinformation and the politicization of census processes pose significant barriers. Concerns about the misuse of census data by governments—impacting resource distribution and parliamentary representation—undermine public trust. To counter such challenges, it is crucial for National Statistical Offices (NSOs) to be perceived as independent institutions that safeguard data confidentiality and maintain public confidence. Many NSOs have effectively addressed misinformation through creative communication campaigns, often leveraging social media to engage and reassure the public.

ii. Data Availability and Quality

In many countries, especially low- and middle-income ones, vital statistics systems and migration registers are incomplete or outdated, leading to gaps in data on births, deaths, and migration, and the need to rely on survey data.

iii. Under-Enumeration

Censuses can suffer from undercounts, particularly in hard-to-reach or marginalized populations. These deficiencies can affect the accuracy of the base population and the vital rates.

Box 5: Hard-to-Reach Population Groups

The definition of hard-to-reach population groups varies across contexts, depending on the available data sources and national circumstances. Two primary reasons can explain why certain groups are considered hard to reach:

- Challenges with Traditional Survey Methods: These groups may be difficult to locate, contact, or interview through conventional methods. Examples include highly mobile populations, homeless individuals, undocumented and irregular migrants, and other marginalized groups. Such populations are

often underrepresented in large-scale data collection efforts like censuses and surveys but may be partially captured in administrative data sources.

- Gaps in Register-Based Statistics: In register-based systems, hard-to-reach groups may not appear in records or may lack identifiable markers such as "signs of life." Examples include undocumented migrants, indigenous populations, children, and older adults. These gaps could result from issues with register accuracy or because certain groups fall outside the scope of registers. Addressing these gaps often requires supplementary surveys or modelling.

Certain groups are often overlooked in statistical data collection, despite their increasing importance. For example, older adults residing in care homes, assisted living facilities, and similar institutions—a growing demographic in many aging societies—are typically excluded from traditional household surveys. Collecting data on their unique circumstances is essential for designing policies that effectively address the needs of all older adults, regardless of their living arrangements. For a current state of age-disaggregated data, highlighting both the achievements and the gaps that must be addressed to ensure that older persons are not left behind when reporting on Sustainable Development Goal indicators, please see: Improving the visibility of older persons in global statistics (ONS, Stats SA, 2024).

Including hard-to-reach populations in statistical frameworks is critical for ensuring adherence to the principle of *Leave No One Behind*. While various national initiatives aim to incorporate these groups into population counts, an internationally coordinated mechanism is needed to standardize their identification and inclusion.

A unified conceptual framework and international recommendations for estimating the size and characteristics of hard-to-reach populations are essential. Disaggregating these populations into specific subgroups—such as undocumented migrants, homeless individuals, institutionalized individuals, highly mobile populations, children, and older adults—would facilitate targeted analysis and policy development. Acknowledging this, the Conference of European Statisticians (CES) has established a Task Force on hard-to-reach groups in administrative sources to identify best practices for accessing hard-to-reach populations through administrative sources and assess the prevalence of different hard-to-reach groups in the UNECE Member States.

iv. Migration Data Deficiencies

Migration is often the weakest component of population data systems because of inconsistent data collection and tracking methods, and most general household surveys are unable to provide relevant information. Despite mounting demands for evidence to inform migration policy, significant gaps persist in international migration statistics. For instance, according to the data collection of the Demographic Yearbook of the Statistics Division of the Department of Economic and Social Affairs of the Secretariat, at the global level, statistics on migrant inflows since 2015 are available for only 61 countries and areas[12] and on outflows for 31 countries and areas. [13] Statistics on migrant stock during the current census round (2015-2024) at the global level are available for only 61 countries and areas. [14] Among these, not all are able to produce migration statistics disaggregated by key characteristics such as age and sex. [15]

These data are essential for integrating migrants into national development planning and for estimating population changes. With many countries experiencing rising life expectancy and declining fertility rates, migration has become a crucial component of both demographic and social change.

[12] Refers to the tabulation of total inflows by reason for admission. Consulted 13 November 2024 at http://data.un.org/. Data for the European countries are compiled by Eurostat and are not included in the analysis.
[13] Refers to the tabulation of total outflows by status at time of departure. Consulted 13 November 2024 at http://data.un.org/. Data for the European countries are compiled by Eurostat and are not included in the analysis.
[14] Refers to the tabulation of total of native and foreign-born population. Consulted 13 November 2024 at http://data.un.org/.
[15] It should be noted that countries may collect more data than they report as part of the Demographic Yearbook data collection.

Box 6: Improving International Migration Data in Indonesia: Initiative of the SDMI (Indonesia One Data on International Migration)

Indonesia's *One Data* policy, established through a Presidential Regulation, aims to streamline data collection by unifying efforts across government agencies and reducing redundancy. Under this initiative, the *Indonesia One International Migration Data* (SDMI) was launched in 2019 to address the pressing need for more accurate and timely international migration data. This initiative supports Sustainable Development Goals (8.8 and 10.7) and aligns with Law No. 18 of 2017 on the protection of international migrant workers.

The SDMI is designed as a collaborative platform that integrates administrative data, facilitating annual updates to replace the previous five-year intervals provided by censuses and surveys. It includes a business process for data governance and mechanisms for data sharing, collaboration, and dissemination. Expected outputs include a module with standardized definitions and indicators, a data-sharing platform, enhanced data quality, and policy recommendations to inform evidence-based decision-making.

Despite its progress—such as raising awareness among agencies, identifying available data, and drafting a roadmap—the SDMI faces challenges. These include the absence of standardized migration data, limited infrastructure for collaboration, and regulatory inconsistencies that hinder data interoperability. Efforts are underway to address these issues, including the development of a dashboard, capacity-building activities, and the preparation of legal frameworks to facilitate collaboration and data sharing.

Source: Presentation by Mr. Ali Said, Director of Population and Labour Statistics, BPS-Statistics Indonesia during the webinar *Building modern and resilient population data systems to enhance data quality, improve cost efficiency and policy relevance*

v. Timeliness and Frequency

Challenges related to the timeliness and frequency of population data can significantly impact the accuracy and reliability of population estimates. Infrequent censuses or delays in data collection can lead to outdated information, making it difficult to capture recent demographic changes and produce timely estimates. Similarly, infrequent updates to administrative registers, such as birth and death records, can result in incomplete or inaccurate data, affecting the quality of population estimates. Issues related to timeliness and frequency can pose significant challenges, especially in contexts of rapidly changing populations, as outdated or incomplete data may not reflect the current demographic reality. Ensuring timely and frequent data collection and updates is therefore crucial for maintaining accurate and reliable population data systems.

vi. International comparability of population estimates

Several challenges impact the accuracy and comparability of population estimates across countries, including the lack of harmonized guidelines for reconciling different data sources, as many countries fail to consistently evaluate or adjust their base population data, resulting in discrepancies between national and international estimates. Additionally, the absence of detailed metadata makes it difficult to assess the reliability and comparability of estimates, while variations in data definitions and availability further exacerbate inconsistencies. Despite these issues, there are opportunities to enhance population data systems through the growing use of administrative data, geospatial techniques, and digital census methods, which can help address data gaps and improve the timeliness and granularity of population estimates.

3. Opportunities

To improve demographic data, countries should try to modernize their systems to produce reliable, timely, and internationally comparable population estimates. This entails the integration of various data sources and the adoption of advanced technologies. As data demands grow, it is essential to ensure transparency and data quality through comprehensive metadata and enhanced methodologies. These efforts are vital for creating robust demographic and social statistics that support governments and organizations in achieving development objectives and enhancing the well-being of populations worldwide.

i. Adoption of international standards

The following international standards and methodologies can support countries' efforts to improve demographic statistics and guide the production of population estimates:

- **Demographic Accounting Framework:** The demographic balancing equation provides a standardized method for calculating population changes by accounting for births, deaths, and migration at both the individual and aggregate levels, depending on data availability.
- **Principles and Recommendations for Population and Housing Censuses[16]:** Issued by the United Nations, serves as a comprehensive guide for national statistical offices and census officials worldwide. These guidelines cover all aspects of census planning and execution, including methodology, content, management, enumeration, data processing, evaluation, dissemination, and quality assurance. Their primary aim is to support countries in conducting censuses that produce reliable, high-quality data while ensuring comparability across different nations and regions.
- **Handbook on Registers-based Population and Housing Censuses[17]:** Issued by the United Nations, aims to strengthen the capacity of national statistical offices and census agencies in the process of transitioning from full field-based census methodology to other approaches involving the use of administrative registers and/or sources. It aims to enhance the efficiency, accuracy, and cost-effectiveness of censuses by leveraging existing administrative data.
- **Civil Registration and Vital Statistics:** The United Nations has produced a wealth of methodological guidelines on civil registration and vital statistics including the Principles and Recommendations for a Vital Statistics System, Rev 3, Handbook on Civil Registration and Vital Statistics Systems: Management, Operation and Maintenance, Revision 1, Handbook on Civil Registration, Vital Statistics and Identity Management Systems: Communication for Development, Guidelines on the Legislative Framework for Civil Registration, Vital Statistics and Identity Management.
- **Recommendations on Statistics for International Migration and Temporary Mobility:** The increasing demand for data, together with the growing complexity of migration patterns, and, in parallel, technological advances in data collection and processing, has created both opportunities and challenges for national statistical systems. This evolving landscape has highlighted the need for updated international statistical standards that can better capture contemporary mobility patterns while promoting harmonization and comparability of migration statistics across countries. In response to these developments, and following the mandate given by the Statistical Commission in 2018 through its decision 49/101, the United Nations Expert Group on Migration Statistics, in collaboration with the Statistics Division, has undertaken a comprehensive revision of the *Recommendations on Statistics of International Migration, Revision 1*[18] to better meet current and emerging data needs. The report of the Secretary-General on Migration Statistics for the 56th session of the UN Statistical Commission[19] provides an overview of the revised Recommendations, which are presented to the Commission as a background document. Key components of the revised Recommendations underwent extensive global consultations and were previously endorsed by the Commission, including the conceptual framework and concepts and definitions on international migration (decision 52/109) and the core and additional indicators on international migration and temporary mobility (decision 54/104). In 2025, as requested (decision 2024/312), the Commission will be asked to endorse the revised Recommendations in their final format, bringing together these and other core elements.
- **Population Accounts:** Developing international standards for Population Accounts is crucial for reconciling data from diverse sources and ensuring consistency across fertility, mortality, and migration estimates. Countries need clear statistical methodologies to reconcile diverse data sources and produce consistent population estimates across periods and regions. Relevant references include the World

[16] The UN Principles and Recommendations for Population and Housing Censuses Rev 4 will be presented to the Statistical Commission at its 56th session in March 2025.

[17] The Handbook on Registers-based Population and Housing Censuses is available at https://unstats.un.org/unsd/demographic-social/publication/handbook-registers-phc.pdf

[18] ST/ESA/STAT/SER.M/58/Rev.1.

[19] E/CN.3/2025/10

Population Prospects 2024: Methodology of the United Nations population estimates and projections, Basic Methodology for the Recalculation of Intercensal Population Estimates, Method protocol for the evaluation of census population data by age and sex and Data and Methods for the Production of National Population Estimates: An Overview and Analysis of Available Metadata,

Countries are encouraged to improve metadata availability and to follow these frameworks to ensure that their population estimates are transparent, reliable, and follow best practices. These standards help to maintain internal consistency across population groups, ensuring that population estimates are aligned with fertility, mortality, and migration data.

ii. Use of administrative data

Leveraging administrative data offers significant advantages for enhancing population estimates. By incorporating records from various sources such as health, education, and tax systems, we can supplement traditional data collection methods, leading to more timely and cost-efficient estimates. Administrative data can fill gaps in census data or surveys, providing a more comprehensive and up-to-date picture of the population. Furthermore, these records can be used to validate and improve the quality of field-collected data by identifying inconsistencies or errors.

iii. Data integration

Strengthening the statistical capacities and data infrastructure to support the integration of multiple data sources, such as censuses, surveys, administrative records, and geospatial sources enhances data completeness, improves data granularity and timeliness, and allows for more detailed analysis.

Box 7: Uruguay: Integrated System of Statistical Records and Surveys (SIREE): Geo-Statistical Data Warehouse of the National Institute of Statistics (INE)

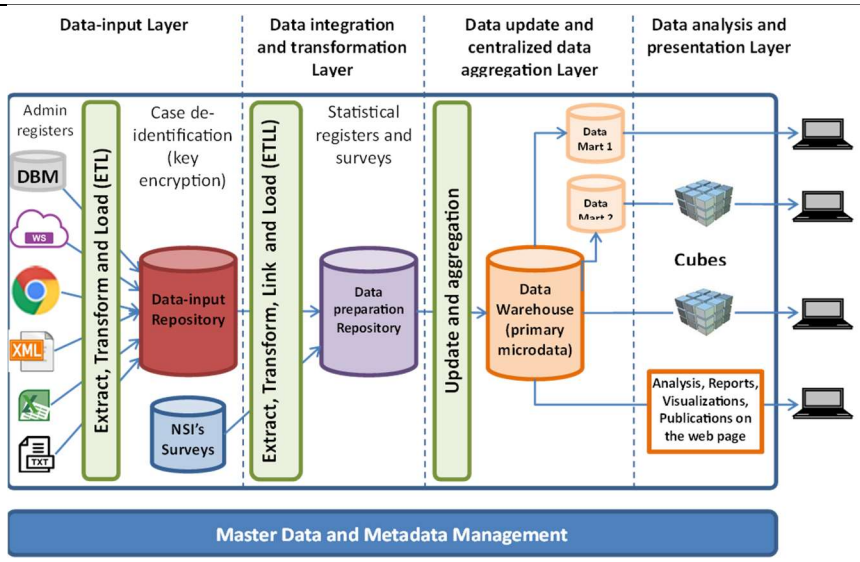
The Geo-Statistical Data Warehouse is a technological solution designed to integrate, organize, and analyse large amounts of data from administrative records, censuses, surveys, and other sources (big data). Its main objective is to offer an efficient environment for the creation and management of statistics with great geographical and thematic disaggregation.

Data Warehouse Concepts and Architecture

The Data Warehouse (DW) is organized based on a process of extraction, transformation, integration, and loading of data (ETL) which allows the integration of different data sources, editing, standardization, integration, and storage in an optimal format for analysis. In particular, the Geo-Statistical DW incorporates tools and methods to integrate geospatial and temporal data, offering a complete and detailed view of demographic, economic, and social phenomena.

The DW architecture design includes the following main layers:

1. Data-input layer: data is received from censuses, surveys, administrative records, and other sources (big data).
2. Data integration and transformation layer: data is processed, and mapping and standardization of variables are performed to ensure consistency.
3. Data update and aggregation layer: data is constantly updated and organized into a useful format.
4. Data analysis and presentation layer: this layer uses advanced tools for generating reports, analysis, and visualizations that facilitate access to information.



In this context, multidimensional cubes are a key piece in data analysis, as they allow the exploration of large volumes of information from multiple perspectives, facilitating in-depth analysis and informed decision-making.

Multidimensional cubes for statistical analysis

Data cubes are structures that organize data into multiple dimensions, making it easier to analyze data from different angles. These dimensions are often related to key variables, such as time, location, demographic characteristics, and more.

Each cube consists of:

- Dimensions: These are categorical variables used to classify data. In the case of Geo-Statistical DW, the main dimensions may include geographic location (departments/provinces, cities), time (years, months), and socio-demographic categories such as age, sex, or educational level.
- Cells: Each cell in the cube represents an event. For example, in a population cube, a cell might represent the number of people in a specific province, in a given year, with a particular educational level.
- Granularity: refers to the level of detail of the data stored. In Geo-Statistical DW, granularity can range from individual-level data to aggregated statistics for a geographic area or time period.

The use of multidimensional cubes facilitates multivariate and longitudinal analysis, allowing rapid answers to complex questions, such as the evolution of the population in a geographic area over time or the impact of public policies on different demographic segments.

Extraction, Transformation and Load processes and data quality

Transforming data for use in the Data Warehouse requires a series of automatic and semi-automatic processes that ensure the quality, consistency, and coherence of the data. These processes include:

1. Data extraction: the collection of data from multiple sources, such as administrative records from different ministries and public entities.
2. Data transformation: the extracted data is cleaned, standardized, and mapped to ensure its uniformity. This step also includes the creation of derived or aggregated variables, which allow for enriching the statistical analysis.
3. Data integration: data is integrated or linked with different sources, which allows for improving the coverage and quality of statistical variables.
4. Data load: The transformed data is loaded into the Data Warehouse in a structured format ready for analysis.

An important feature of the transformation process is data validation, which ensures that the data is correct and useful for analysis. Multidimensional cubes are built from this validated data, ensuring that the statistics generated are reliable and representative.

Metadata and Master Data Management

Efficient use of the Geo-Statistical DW is supported by a robust metadata management system. Metadata documents the structure and content of stored data, facilitating its interpretation and reuse. This system also allows the origin of data to be traced, ensuring transparency and reliability in the analysis process. In addition, the master data management system ensures that key entities (such as people, dwellings, or businesses) are correctly identified and managed throughout the entire process, avoiding duplications and guaranteeing data integrity.

Geo-Statistical Data Warehouse Implementation

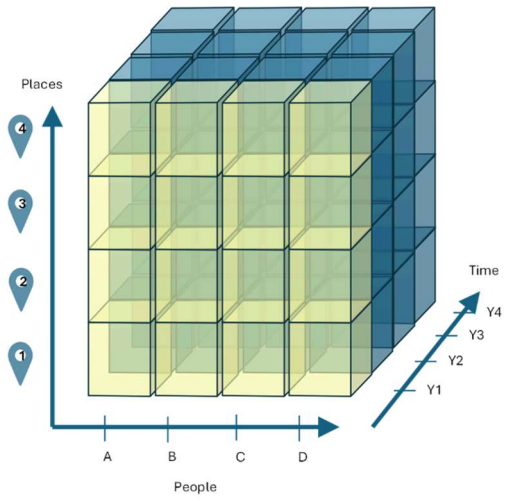
The National Institute of Statistics of Uruguay, as administrator of the Geo-Statistical DW, has implemented a process-oriented management strategy that facilitates the integration of administrative records from multiple institutions. This approach allows the creation of a robust statistical system that optimizes the use of data and ensures quality and relevance for end users, including policymakers, researchers, and citizens. Using data marts makes it easy to query and analyse specific subsets of data. These are specialized versions of the data warehouse that focus on particular topics, such as education, health, or employment. Data marts are designed to facilitate the analysis of these specific topics by providing pre-processed data organized by key dimensions, such as age, gender, and geographic location.

Multidimensional Analysis in the Geo-Statistical Data Warehouse

Multidimensional analysis in the Data Warehouse is based on the organization of data in multidimensional cubes, where each cube contains different dimensions that allow the data to be examined from different perspectives. Each dimension is an axis on which the data is grouped, and each combination of elements of these dimensions defines a unique point in the cube, which represents a specific event.

In the case of the Geo-Statistical Data Warehouse, the main dimensions for analysis typically include:

- *People:* This dimension encompasses the sociodemographic characteristics of the target population, such as sex, age, educational level, and occupation. These characteristics can also serve as additional dimensions to create new multidimensional analysis cubes.
- *Time:* This dimension considers the temporal frame in which events or changes occur, ranging from years and months to days or other relevant time units.
- *Place:* Crucial for spatial analysis, this dimension situates data within a precise geographic context. In the case of a Geo-Statistical Data Warehouse (DW), the spatial dimension can include geographic coordinates, administrative regions, departments or provinces, cities, or even smaller units like neighbourhoods.



People dimension: sociodemographic characteristics

The people dimension enables data to be disaggregated by key attributes of individuals, supporting comprehensive sociodemographic analysis. For instance, this dimension allows studies on how migration patterns differ between men and women of various age groups over a specific period or how educational attainment is distributed across different regions.

Temporal dimension: longitudinal analysis

The temporal dimension provides a dynamic layer of analysis, enabling the study of trends and the creation of time series. In the Geo-Statistical Data Warehouse, time can be represented at various scales—years, quarters, months, or even days—offering great analytical flexibility. Applications of the temporal dimension include:

- Population evolution: Analysing changes in population growth, aging, or migration over time.
- Policy impact analysis: Evaluating the effectiveness of public policies or social programs, such as housing or healthcare initiatives, by examining their evolution over time in terms of coverage and success.
- Seasonal changes: Understanding seasonal phenomena, such as infectious disease outbreaks or fluctuations in unemployment rates.

When combined with the spatial dimension, temporal analysis provides insights into how events like epidemics or internal migration unfold across both time and space, offering a holistic view of the dynamics of social and economic phenomena.

Place dimension: the spatial component of analysis

The place dimension introduces the critical spatial component to analysis, anchoring observed phenomena within specific geographic contexts. This dimension is fundamental to the Geo-Statistical Data Warehouse, as it enriches multidimensional analysis by incorporating geospatial information. Key elements of spatial analysis include:

- Geographic coordinates: Latitude and longitude enable precise location mapping, supporting detailed geospatial analyses.
- Administrative regions: Provinces, municipalities, or other geopolitical subdivisions allow for data aggregation and the generation of region-specific statistics to inform planning and governance.
- Census units: Smaller subdivisions enable granular analyses of urban or rural data.

Applications of the place dimension include:

- Mapping socioeconomic indicators: Visualizing poverty levels or access to education across regions to identify areas requiring policy intervention.
- Internal migration studies: Combining people, time, and place dimensions to analyse migration patterns, such as rural-urban shifts or depopulation trends.
- Urban phenomena analysis: Studying city growth, housing distribution, or public service accessibility within metropolitan areas for urban planning purposes.
- Geospatial visualization: Using GIS tools to create interactive maps, enabling the visualization of complex findings in an accessible, intuitive format.

Integration of the Three Dimensions

The full potential of the Geo-Statistical Data Warehouse emerges when the dimensions of people, time, and place are integrated. This multidimensional approach enables the analysis of complex phenomena that cannot be fully understood when considering each dimension in isolation.
For example, by combining these dimensions, one could analyse the impact of migration on the educational structure of a region by exploring:

- How internal migration has altered the educational composition of a specific area.
- The effect of migration on rural versus urban population densities.
- Temporal variations in educational attainment across provinces or departments.

This integration provides deeper insights into social and economic phenomena, delivering valuable information to policymakers for designing precise and targeted interventions.

Advancing Statistical Systems with Multidimensional Analysis

The Geo-Statistical System of INE's Data Warehouse represents a significant step forward in modernizing statistical systems. Integrating administrative records with survey data and utilizing advanced tools like multidimensional cubes enables in-depth, flexible analysis. This system enhances the efficiency and quality of statistics while empowering governments and organizations to design and implement data-driven, effective policies. Multidimensional analysis not only enriches understanding but also supports evidence-based decision-making, ensuring that resources are allocated strategically to address societal needs.

Source: Presentation by Mr. Federico Segui, Deputy Director General, National Statistical Institute of Uruguay during the webinar *Building modern and resilient population data systems to enhance data quality, improve cost efficiency and policy relevance* and INE Uruguay (2021). Conceptual and Methodological Framework of the Integrated System of Statistical Records and Surveys – SIREE

iv. Improved statistical methods

Advances in statistical methods can enhance the accuracy and reliability of population estimates. Advanced techniques, such as enhanced cohort-component methods, small area estimation and probabilistic modelling, allow for more precise estimations even with limited data. Some of these methods can effectively address issues such as under coverage in censuses and inconsistencies across different data sources. By incorporating sophisticated modelling and imputation techniques, population data systems can generate more granular and robust estimates, particularly for subgroups or areas with sparse data. Furthermore, advancements in statistical methods enable better integration of diverse data sources, including administrative records and surveys, leading to more comprehensive and timely population estimates. These improvements ultimately contribute to a better understanding of population dynamics.

Box 8: Dynamic Population Mapping

Dynamic population mapping involves estimating the real-time distribution of populations within a specific area using mobile positioning data (MPD). Unlike traditional censuses or population registers, which capture long-term population data, dynamic mapping enables analysis of population shifts across months, days or hours. By leveraging location information from mobile phones, maps can be constructed that reveal human presence and movement patterns beyond fixed places of residence.

Dynamic population mapping offers several advantages, including near real-time data availability, enhanced granularity, and the ability to produce new indicators previously unavailable in traditional data sources. Its automatic collection makes it cost-effective, and the extensive use of mobile phones ensures large and detailed datasets. It complements existing population statistics by improving timeliness, spatial resolution, and calibration opportunities for traditional data.

Despite its benefits, MPD-derived information has limitations. It does not cover the entire population, may include noise or erroneous records, and requires significant data cleaning to ensure accuracy. MPD is not a replacement for traditional population data but serves as a supplementary source. Issues like subscriber selectivity, overlap, and cell tower imprecision require careful methodological approaches to address these challenges. Additionally, since MPD is owned by Mobile Network Operators, using it for statistical purposes involves navigating data sharing incentives and policies, technical requirements, and data processing capacity constraints while maintaining strong data privacy protections.

Dynamic population mapping has diverse applications, including studying population distributions and movements, disaster preparedness and response, monitoring population redistribution during crises (e.g., COVID-19), and infrastructure and resource planning. It supports the estimation of disease incidence using dynamic denominators, the creation of dynamic sample frames for surveys, and improvements in census operations, intercensal estimates and addressing mobile population undercounts.

Source: "Guide on the use of mobile phone data for dynamic population mapping" United Nations Committee of Experts of Big Data and Data Science in Official Statistics (UN CEBD), MPD Task Team, 2022.

v. Technological innovations

Countries are encouraged to modernize their population data systems by adopting digital-first solutions, multi-mode methods, and integrating geospatial information with administrative data sources. These advancements are essential for producing reliable, timely, and internationally comparable population estimates. Investment in technological infrastructure is critical to harnessing the full potential of tools like big data analytics and modern census methods, which can address persistent data gaps and improve data quality. The integration of geospatial information systems into census operations further enhances coverage monitoring, quality control, and census management while providing valuable insights for analysis and policy-making. Linking population data with geospatial information enables policymakers to identify regional disparities, assess resource needs, and track demographic trends, supporting more effective decision-making.

vi. Linking demographic and economic data

To enhance understanding of how population growth and changes in age structure impact economic growth, gender and generational equity, public finances, and other key aspects of the macro-economy, the methodology of National Transfer Accounts (NTAs) was developed. NTAs provide a comprehensive accounting framework for tracking economic flows between different age groups or generations within a national population over a given year. These accounts measure production, consumption, savings, and transfers across age groups, allowing for the disaggregation of national accounts data by age. This enables detailed analyses of the distribution of consumption, income, and social expenditures. The National Transfer Accounts Manual, developed by the United Nations Population Division presents the concepts, methods and estimation procedures to measure economic flows over the life-cycle.

NTAs offer valuable insights for policymakers by shedding light on critical areas such as public policy for pensions, healthcare, education, and reproductive health; the role of social institutions like extended families; the full economic contributions of women; and the social, political, and economic implications of population aging. By providing this granular perspective, NTAs help to inform more equitable and effective policy decisions.

vii. Engaging stakeholders

Engaging stakeholders is essential for strengthening population data systems. Collaboration among governments, researchers, and international organizations fosters the exchange of expertise and innovation, driving improvements in data quality and usability. Building partnerships with stakeholders and data users promotes trust and ensures demographic data is effectively integrated into policy-making, enabling evidence-based decisions and securing resources for maintaining and enhancing these systems. Additionally, producing and disseminating comprehensive and accessible metadata enhances transparency, fostering confidence in the reliability of population data and its application in addressing critical development challenges. Acknowledging the importance of engaging stakeholders, a standardized process model could be developed to outline the key stages of stakeholder engagement.

viii. International collaboration

International collaboration is essential for sharing best practices, building capacity, and harmonizing standards to ensure that population estimates are consistent and reliable across different countries.

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5. Annex A.1: Summary of population data systems characteristics

Type of system	Full field-enumeration census systems	Register-based systems:	Combined systems.
Description	• Relying on periodic complete field enumeration of the population • A census aims to count every person in a country at a specific point in time • Typically, full field enumeration every 5-10 years	• Relying on continuously updated population registers and records of vital events (births, deaths, migration) and (a) other administrative data linked at the individual level, or (b) existing sample surveys or integrated administrative sources and existing sample surveys	• Combining data collected from full field enumeration or one or more surveys with administrative data sources or statistical registers
Key Features	• Accurate if conducted well, but costly and infrequent. • Post-census adjustments often required	• Linked administrative data sources • Variable thematic coverage depending of the data sources • Provides timely and regular data updates on demographic changes • High accuracy when records are maintained properly	• Increasing use of administrative data to supplement census • Cost Efficiency: reduces reliance on full-field enumeration • Improved Timeliness: provides more frequent updates than traditional censuses • Data Quality: Helps improve the granularity of data, particularly when linked with other data sources
Geographical Distribution	• Predominantly used in countries without developed administrative data systems	• Primarily used in Northern Europe and some Asian countries, requires advanced statistical infrastructure	• Becoming more common in countries with advanced administrative capabilities (e.g., Europe, North America) and a growing number of

			countries with the 2020 round of censuses in parts of Asia and Latin America
Census or population register role in population estimates	• Census acts as a critical baseline for population estimates and projections. • Census provides benchmark data for other systems (vital registration, administrative data).	• Population register provide a continuous source of data that supports inter/post-censal estimates	
Population estimates	At aggregate level for different level of geography/groups • Inter/post-censal estimates using demographic balancing equation and cohort-component population projection methods • Relies on vital statistics, and migration data between and after censuses	At individual level • Estimates based on individual level record linkages between multiple data sources, including increasingly additional validations with sign-of-life • Relies on vital records, migration and residency status from civil registration and admin. sources	At individual level • Estimates based on aggregate and/or individual level record linkages between multiple data sources, including increasingly additional validations with sign-of-life • Relies on vital statistics, migration and residency status from civil registration, admin. sources and surveys

B. Places[20]

1. Introduction

The concept of "place"[21] or geography is intrinsically tied to social and demographic characteristics. Social and demographic phenomena occur within specific territories, making geography indispensable for their observation, measurement, and analysis. The interaction between population groups and their living and working environments reveals critical patterns of inequality, migration, economic opportunity, and social mobility. Incorporating geography into the measurement and analysis of these phenomena deepens our understanding of their complexities and dynamics.

Strengthening the role of geography in social and demographic statistics involves tackling several key challenges, such as: How can we better leverage the geographical information already available in many sociodemographic data sources to improve both their usability and analytical potential? What methods can we use to integrate diverse data sources to consistently produce more granular and comprehensive sociodemographic statistics? What steps are needed to combine different types of statistics across various geographical levels to offer a holistic understanding of social and demographic phenomena? How can new data and technologies be available to citizens, and citizen-generated information reach decision-makers and other stakeholders, creating virtuous conversations and synergies?

To link sociodemographic phenomena to the places where they occur and analyse them alongside other information, statistical data must be georeferenced. This means associating statistics with specific geographic locations, either as aggregated statistics (e.g., mean years of schooling by department) or at the unit of observation level (e.g., each observation in a population census including location variables)[22].

While georeferencing of statistical data is the foremost way of integration, geospatial and Earth observation data can also be a primary source, to generate statistics based on spatial and population patterns over time and other distinct features based on the analysis of the territory using maps, photographs or satellite images. Thus, geospatial information can provide reference, and context and enhance analytical power through visualization of patterns and processes in space and over time.

This section proposes to explore the different ways in which social and demographic statistics interact with the concept of “place” across three dimensions:

A. The role of place in supporting the production of social and demographic statistics: This dimension addresses the various ways in which geographical information can improve the production of social and demographic statistics.
B. The role of place as a link within and across statistical pillars, as well as for dissemination: This dimension examines how geography and geographical standards facilitate the integration of various statistical data.
C. The role of place as a factor associated with social outcomes and policymaking: This dimension explores how geographical context (rural/urban condition, population density, isolation, segregation) reflect and influence social and demographic outcomes and inform policy decisions.

2. Ways in which social and demographic statistics interact with the concept of “place”

i. The role of place in supporting the production of social and demographic statistics

One of the primary sources for producing sociodemographic statistics is population and housing censuses, which provide the most granular geographical information in official statistics. Administrative registers are also valuable sources of information with highly disaggregated geographical scope. Household surveys are

[20] The task team working on the in-depth research of the building block PLACES was composed of members from Mexico’s National Institute of Statistics and Geography (INEGI), the National Institute of Statistics of Rwanda, the Economic Commission for Latin America and the Caribbean (ECLAC) and the United Nations Statistics Division (UNSD).
[21] In this document, 'place' refers to the geographical locations where social and demographic events occur, encompassing physical territories like cities, regions, and countries.
[22] According to the Global Statistical Geospatial Framework (GSGF), every statistical record should include or be connected to a specific geographic reference, ideally using exact coordinates (x and y). If that's not possible, the data should at least be tied to the smallest geographic area available.

another important source, providing frequent and detailed sociodemographic insights, though they have limitations in terms of geographical specificity. Additionally, the production of social and demographic statistics can benefit from using other geospatial data sources[23], either as a primary or complementary source to censuses, administrative records, and surveys. Some key areas where this integration can be impactful include:

a) Incorporating geographical information into the design and implementation of population and housing censuses, household surveys, and administrative registers.

- Census cartography update: This process involves locating all structures within the territory and determining the number of people residing in them. It is a crucial and essential step for ensuring census coverage, as well as for the design and monitoring of the census operation.
- Sampling design: geographic data can be used to keep sampling frames up to date and provide information for their stratification.
- Data collection: Geographic coordinates of each surveyed household can be recorded using GPS-enabled devices, allowing spatial analyses of survey data and the ability to link survey data with other spatial datasets (e.g., environmental conditions, infrastructure).

Box 9: Rwanda: Digital census: opportunity for integration of statistical and geographic information

The 5th Population and Housing Census (PHC) of Rwanda, which was conducted in August 2022, marked a significant milestone in the country's demographic and social data collection efforts. Organized by the National Institute of Statistics of Rwanda (NISR), this census was the first fully digital exercise in Rwanda's history, setting new standards for accuracy, efficiency, and data integration. The use of mobile devices and satellite imagery represented a leap forward in census methodology, enabling the precise capture of household locations and other key demographic data.

The Transition to a Digital Census

The 2022 PHC stands out as Rwanda's first digital census, using handheld devices equipped with Global Positioning System (GPS) technology and satellite imagery to geolocate households throughout the country. This technological approach improved data collection accuracy and allowed for real-time data verification and monitoring. Field enumerators collected data from households using mobile phone feeding directly into a central database, reducing the possibility of data errors and delays that are often associated with manual data entry and paper-based systems.

A key component of this digital transformation was the integration of geospatial information. Before the enumeration phase, a comprehensive census mapping was carried out, which was essential in determining the geographical layout of both residential and non-residential buildings across Rwanda. This census mapping process provided a detailed geospatial database that included buildings' usage across various sectors, including health, education, commerce, and leisure. This mapping effort served not only as the foundation for the enumeration but also created a crucial tool for future urban planning, resource allocation, and policy formulation in the country.

Geospatial Tools for Urban and Rural Classification

One of the most significant achievements of the 5th PHC was its ability to provide a more refined understanding of urban and rural areas in Rwanda. Historically, defining and distinguishing between urban and rural areas in Rwanda has been a complex task due to rapid urbanization and shifts in population distribution. However, the 2022 census was able to address this challenge effectively by combining geospatial data with household information. This integration enabled the accurate delineation of urban and rural areas based on actual population density, proximity to services (such as schools and health centres), and administrative boundaries.

[23] Any source of information that includes geographic locations through spatial identifiers, such as coordinates, addresses or administrative boundaries. These can include satellite imagery and remote sensing, GIS data, transportation and infrastructure datasets, mobile-phone data, among others.

The census was therefore a critical tool for the disaggregation of census data by urban and rural settings, which is vital for designing targeted policies and interventions. For instance, having accurate data on population distribution within these areas can help the government plan the expansion of essential services like water, electricity, and health infrastructure. Furthermore, the geospatial database created during the census serves as a valuable resource for future demographic surveys, development projects, and disaster management efforts.

Enhancing Service Delivery through Census Data

The collection of geospatial data on services such as health, education, and commerce allows for a more detailed analysis of service accessibility in different parts of the country. By overlaying household data with geospatial information, the government and planners can better assess the availability of services and identify gaps in infrastructure or service delivery. For example, it can highlight regions where schools or hospitals are needed or areas that are underserved by essential services like water or electricity.

This linkage between population data and geospatial data is essential for improving public service delivery and promoting equitable development. By knowing where people live and what services are available to them, Rwanda can make informed decisions on where to allocate resources and how to ensure that all citizens have access to the services they need.

Rwanda's 5th Population and Housing Census in 2022 was a landmark event that introduced a fully digital approach to census-taking, leveraging mobile devices and satellite imagery for enhanced accuracy and efficiency. The comprehensive census mapping and the integration of geospatial data with population data allowed for improved classification of urban and rural areas, a significant advancement in demographic studies and urban planning. This innovative approach not only provided a detailed picture of Rwanda's population and housing but also created a foundation for future planning and service delivery improvement in the country.

The results from this census will have long-term implications for Rwanda's development strategies, helping the government and stakeholders make data-driven decisions to foster sustainable growth and equitable access to services across all regions of the country.

b) Use of geographical data to improve the accuracy and granularity of household surveys

Small area estimation (SAE) models have received significant attention as a powerful method for generating disaggregated statistics, taking advantage of the enhanced granularity of information from sources such as censuses, administrative records, and satellite imagery to improve the quality and granularity of household survey-based indicators. The use of SAE methods in official statistics has expanded significantly in recent years[24].

Box 10: Small Area Estimation (SAE): Enhancing Precision in Local Data Collection

Surveys are a primary data source for social and demographic statistics, especially for issues like poverty, unemployment, and time-use, which are difficult to capture through other methods. However, there is a growing demand for more granular data—at the province or municipality level—to inform local policies. The challenge lies in the fact that large-scale surveys often lack sufficient sample sizes to produce reliable estimates at these detailed levels and conducting surveys at such a scale can be prohibitively expensive.

One solution is Small Area Estimation (SAE), a model that improves the precision of estimates for small areas by combining data from multiple sources, including surveys, administrative records, census data, geographic information, and remote sensing. SAE allows for the enhancement of estimates in areas with limited survey data by "borrowing strength" from other sources, thus increasing overall data accuracy.

This methodology is not only useful for geographic disaggregation but also for population group breakdowns, such as by age, sex, or ethnicity. It is crucial for developing data-driven local policies, as it allows for more precise resource allocation and intervention targeting. By integrating geographic information and leveraging spatial statistics, SAE opens immense opportunities to improve data quality.

[24] See for example https://unstats.un.org/wiki/display/SAE4SDG/SAE+for+countries+and+partners.

While SAE can be particularly useful when geographic disaggregation is not feasible through traditional data collection methods, it is essential to carefully assess the quality of the input data and validate the assumptions made in the modelling process. As data availability and computational capacity continue to increase, the potential for expanding the use of spatial estimation and statistics in combination with diverse data sources grows, offering greater precision in local policymaking.

Source: Presentation by Ms. Carolina Franco, Principal Statistician at NORC at the University of Chicago during the webinar *The critical role of information on "places" and geography to improve social and demographic statistics*

Similarly, models that include satellite imagery have been employed to produce population estimates in places without recent population censuses, as well as to help assess census coverage, allowing for a more accurate understanding of population distribution where direct data collection is incomplete or absent.

c) Geospatial data as a tool for geocoding statistical data

Geography provides valuable inputs for geocoding sociodemographic statistics through fundamental datasets such as administrative boundaries, census geographies, cadastral parcels, georeferenced postal addresses, grid cells, and others. These datasets enable interoperability, allowing the integration of data from diverse sources. For instance, using high-quality, standardized location elements, such as physical address, property or building identifiers, or any other precise, current, and consistent location element, facilitates the accurate assignment of geographic coordinates.

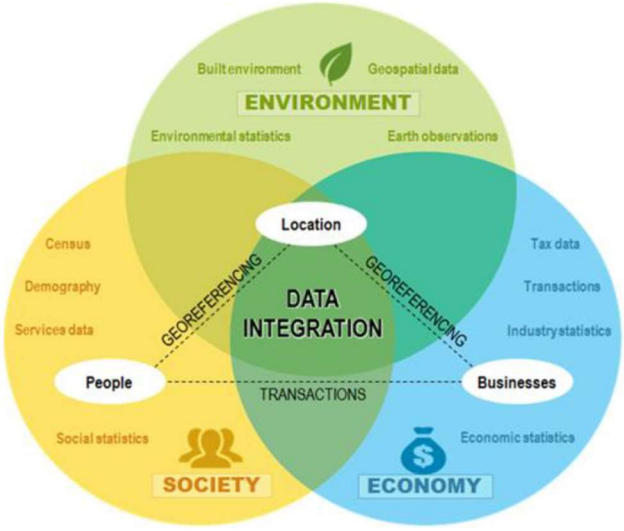
d) Geospatial data as primary sources for indicators

Sources such as GIS data, transportation and infrastructure datasets, mobile phone data and remote sensing and satellite imagery can provide information useful to estimate social and demographic indicators. Examples include indicators on distance to services (schools, hospitals, roads, etc.), education accessibility assessment, migration impact, tourism, land use, health services provision, slums' location, etc.

ii. The role of place as a link within and across statistical pillars and for dissemination

Geography acts as a common reference point that allows for the intersection of various types of data (see Figure 1). It can be a link between sociodemographic statistics and other statistical pillars, allowing integrated, multidimensional analyses to better inform decision-making. This also applies to the integration of statistics within the sociodemographic pillar, by linking data from various sources (obtained, for example, from a census and administrative records) through their location.

Figure 1: Location as a link between society, the economy and the environment



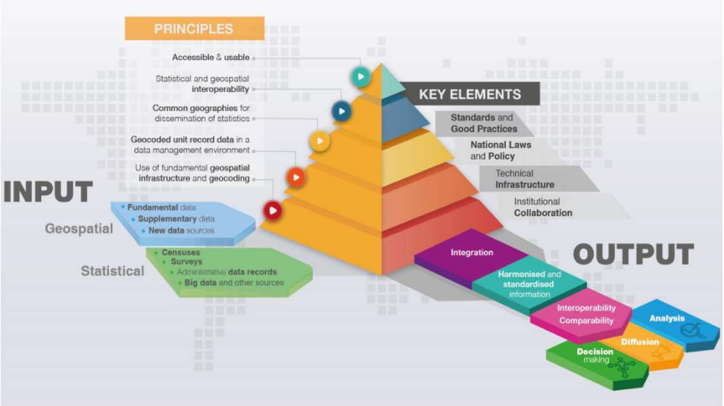
Source: United Nations (2019), The Global Statistical Geospatial Framework, https://unstats.un.org/unsd/statcom/51st-session/documents/The_GSGF-E.pdf

This is accomplished using common geographies, which may include census blocks, grids, and administrative and cadastral boundaries. These shared geographies enable basic statistical reporting, geostatistical analyses, and visualization at different scales –such as at local, sub-national, national, regional, and global–, allowing for consistent comparison and assessment of outputs. These geographies also provide a framework for managing privacy and ensuring confidentiality in statistical and geospatial outputs. Integrating statistical and geospatial information has been well documented by the work of the United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM) and standards such as the Global Statistical Geospatial Framework (UN, 2019).

Box 11: The Global Statistical Geospatial Framework

The Global Statistical Geospatial Framework (GSGF), endorsed by both the Statistical Commission and the UN-GGIM, provides a high-level, adaptable structure for integrating statistical and geospatial data.

Figure: The Global Statistical Geospatial Framework – inputs through to outputs



Composed of five key principles, it ensures data interoperability, comparability, and confidentiality across various contexts. The framework is designed to be applied flexibly to meet the local needs of individual countries.

Principle 1: Use of Fundamental Geospatial Infrastructure and Geocoding. This principle emphasizes building the infrastructure necessary for integrating geographic and statistical information. It involves adopting a consistent method to position each statistical unit in both time and space. Standardized location references—such as addresses, property identifiers, or grid references—are used to ensure accurate geocoding. The addition of time stamps links temporal components to each unit, supporting precise geospatial analysis.

Principle 2: Geocoded Unit Record Data in a Data Management Environment. Principle 2 supports linking each statistical unit to a geographic reference, such as a coordinate or small geographic area. This enables the integration of data from various sources, ensuring that even as geographies evolve, statistics remain applicable and relevant. The ability to manage and link geocoded records allows for seamless geographic context application.

Principle 3: Common Geographies for the Dissemination of Statistics. This principle standardizes geographic definitions and facilitates the aggregation and disaggregation of data to various geographic levels. A consistent set of geographies ensures that statistical data is comparably integrated, enabling users to access, analyse, and visualize data seamlessly across regions of interest. By providing a common geographical framework, this principle allows for meaningful interpretation of statistics, supporting informed decision-making and the development of more effective public policies.

Principle 4: Statistical and Geospatial Interoperability. Fostering standardization, Principle 4 enhances the interoperability of both statistical and geospatial data. By simplifying data creation, discovery, integration, and use, it broadens the scope of available data and technologies for decision-making. This principle promotes collaboration between stakeholders involved in the production and use of geospatial and statistical information, driving efficiency and more impactful analysis.

Principle 5: Accessible and Usable Geospatially Enabled Statistics. Principle 5 focuses on ensuring that geospatially enabled statistics are easy to discover, access, and use. It encourages data custodians to confidently release data and promotes the use of web services for dynamic, machine-readable data linkages. This increases the usability of statistics, facilitating better analysis and informed decision-making at all levels.

Source: Presentation by Mr. Claudio Stenner, Brazilian Institute of Geography and Statistics (IBGE) and Co-Chair of United Nations Expert Group on Integration of Statistics and Geospatial Information (EG-ISGI) during the webinar *The critical role of information on "places" and geography to improve social and demographic statistics*

a) Linking sociodemographic data with other pillars

When sociodemographic statistics are available at the subnational level (e.g., population distribution, sex, and age structure, income levels, ethnicity, disability and others), they can be integrated with economic and environmental data to produce combined indicators (such as subregional GDP per capita, population exposure to air pollution, etc.) and to understand spatial disparities and factors that determine living standards. For example, spatially disaggregated demographic, social, and economic indicators are needed to prepare diagnoses and allocate resources for housing policies.

A particularly relevant geographical standard for social and demographic statistics is the Degree of Urbanisation (DEGURBA) method to delineate cities, towns, suburbs, and rural areas for international statistical comparison, adopted by the 51st Statistical Commission of the United Nations in 2020[25].

Box 12: The Degree of Urbanization Method: Ensuring Harmonized Definitions for Urban and Rural Areas

The DEGURBA (Degree of Urbanization) methodology provides a harmonized approach to defining and analysing urban and rural areas, addressing a key challenge in global statistical comparisons. While effective, people-centred policymaking requires both disaggregated information at the local level and aggregated data for broader analysis, the lack of a universally adopted definition for urban and rural areas has made international comparability in statistics related to urban and rural areas challenging. This challenge is especially relevant for monitoring many Sustainable Development Goals, which are tied to specific geographies like urban, rural, or city areas.

DEGURBA uses a two-step process to classify areas based on population grids and local administrative units:

1. **Grid Cell Classification**: A 1 km² population grid is used to categorize cells based on population density:
    - **Urban Centres**: Cells with more than 1,500 residents per km² and at least 50,000 people.
    - **Urban Clusters**: Cells with more than 300 residents per km² and at least 5,000 people.
    - **Rural Grid Cells**: Cells with fewer than 300 residents per km² or outside urban clusters/centres.
2. **Local Administrative Unit Classification**: Areas are classified based on where the population resides:
    - **Cities**: Areas where 50% or more of the population lives in one or more urban centres.
    - **Towns and Semi-Dense Areas**: Areas where over 50% of the population lives in urban clusters but not classified as cities.
    - **Rural Areas**: Areas where over 50% of the population lives in rural grid cells.

This methodology enables more accurate and consistent spatial analysis, allowing policymakers and statisticians to compare indicators such as poverty risk and access to services across urban and rural areas. By using DEGURBA, data can be more relevant, transparent, and comparable for making informed decisions that support the SDGs.

Source: Presentation by Mr. Robert Ndugwa, Chief, Data and Analytics Unit, UN-Habitat during the webinar *The critical role of information on "places" and geography to improve social and demographic statistics*

[25] "A recommendation on the method to delineate cities, urban and rural areas for international statistical comparisons", https://unstats.un.org/unsd/statcom/51st-session/documents/BG-Item3j-Recommendation-E.pdf

b) Dissemination of data

Geography plays a critical role in how sociodemographic statistics are disseminated. Geospatial visualization tools, such as maps and spatial dashboards, can communicate complex data in a clear and actionable way. Spatially disaggregated data is more accessible and understandable when presented visually, for public policymakers and decision-makers, as well as various users from both central and local government. Several National statistical agencies have implemented interactive geospatial platforms to disseminate statistics.

Box 13: Geospatial Analysis and Decision Support for Effective Policymaking

Policymakers and analysts often struggle with extracting actionable insights from large, complex sociodemographic datasets, which can hinder the development of effective solutions to social challenges. Geospatial analysis offers a valuable tool in this context, helping decision-makers understand and address issues that have a geographic or spatial component.

Two key features of geospatial components are essential for effective policymaking:

1. Attributes that Define Places: Factors such as infrastructure, land use, and sociodemographic characteristics are crucial in understanding the dynamics of different areas. These attributes provide a more comprehensive picture of local conditions, guiding policy development tailored to specific needs.
2. Multiple Actors in the Decision-Making Process: Successful policymaking involves collaboration among various stakeholders, including decision-makers, analysts, and the general population—all of whom are impacted by policies. This collective effort ensures that policies reflect the realities on the ground.

Effective place-based decision support requires ongoing communication, collaboration, and flexibility among stakeholders. Geospatial data should be analysed and presented in a way that is accessible and useful to all parties involved. One approach to facilitate this is through the development of geo-visual frameworks and dashboards that support the analysis of multivariate and spatial-temporal data. These dashboards should be designed to allow users to identify targeted solutions, with clear statistical calculations and interpretation guides to assist decision-makers. Usability testing and assessing the efficiency of the analysis are crucial to ensure that these tools effectively support the decision-making process.

Source: Presentation by Mr. Baruch Sanginés, Demographer and Geographer, Researcher at the Center for Research in Geospatial Information Sciences (FLACSO) during the webinar *The critical role of information on "places" and geography to improve social and demographic statistics*

iii. The role of place as a factor associated with social outcomes and policymaking

Territorial analysis is essential for identifying spatial disparities in social development indicators such as mortality and fertility rates, income, education, health, and infrastructure. Space can be a determinant of social outcomes, as geography can influence proximity to resources, standards of living, exposure to hazards and risk factors, and accessibility to infrastructure. These inequalities often reflect deeper structural issues related to geographic isolation, uneven investment, and historical exclusion of certain regions. Territorial analysis enables governments to design and implement targeted policies that address the specific needs of the population at different subnational levels and ensure leaving no one behind.

Several analysis techniques take advantage of the availability of sociodemographic information at a disaggregated geographic level, such as spatial econometrics, spatial autocorrelation analysis (Moran's I), point pattern analysis, and spatial interaction models, among others.

Some examples of relevant social and demographic topics where geography plays a key role include:

- Disaster risk reduction: Geographically disaggregated social and demographic statistics can help identify vulnerable populations, assess risks, and plan targeted interventions. By combining geographic data with demographic information, authorities can map risks, improve early warning systems, and ensure equitable distribution of resources during and after disasters. These data also

support long-term resilience planning and climate adaptation by identifying high-risk areas and vulnerable communities (see Sendai Framework for Disaster Risk Reduction 2025-2030).

- Health: Geographically disaggregated social and demographic statistics played a key role during the COVID-19 pandemic. By combining data such as age, income, and pre-existing health conditions with geographic information, policymakers were able to identify high-risk areas and vulnerable populations, ensuring targeted interventions like vaccine distribution and lockdown measures.
- Residential segregation: Geospatial social and demographic statistics are crucial for analysing residential segregation. Information on the spatial distribution of populations based on factors like race, income, and ethnicity helps identify patterns of disparities in access to resources, such as education, employment, and healthcare.

Box 14: Residential Segregation: Understanding and Measuring its Impact on Social Inequality

Residential segregation plays a significant role in reinforcing and exacerbating social and economic disparities. It often concentrates poverty in specific neighbourhoods while isolating valuable resources in other areas. This geographical division contributes to perpetuating intergenerational inequalities. For example, school funding is often allocated based on local property taxes, meaning students in economically disadvantaged areas attend underfunded schools, which leads to lower-quality education and fewer opportunities.

The impact of residential segregation is multidimensional, influencing various social outcomes such as employment, education, and health. Areas with limited access to essential infrastructure—such as transportation, schools, and healthcare—tend to exhibit poorer outcomes in these areas. By linking geocoded data on infrastructure with statistical data on social outcomes, it becomes clear that residential segregation is intertwined with multiple dimensions of inequality. Addressing this issue requires a comprehensive, place-based approach that integrates multiple social and economic factors to better understand the local socio-economic environment.

Although residential segregation is persistent over time, it fluctuates daily. For example, 75% of the UK's most deprived areas in 2010 remained the most deprived in 2019, illustrating the structural inertia in socio-economic systems. However, some marginal areas may experience improvement, highlighting the importance of monitoring progress with relevant indicators. Furthermore, residential segregation varies by time of day: it is higher at night than during the day, and lower on weekends than on weekdays. Traditional measures of segregation, based only on nighttime populations, miss these daily fluctuations. New data sources, such as mobile phone data, offer insights into these dynamics and can inform urban planning strategies. Strategically locating services in diverse areas could promote integration and reduce segregation, leading to more inclusive communities.

Source: Presentation by Prof. Francisco Rowe, Professor in Population Data Science and the Lead of the Geographic Data Science Lab, Department of Geography and Planning, University of Liverpool during the webinar *The critical role of information on "places" and geography to improve social and demographic statistics*

- Poverty: Geographically disaggregated poverty rates have been used by several countries to design policies and allocate public resources. A relevant example is the Small Area Income and Poverty Estimates (SAIPE) program, run by the U.S. Census Bureau, which provides annual estimates of income levels and poverty rates for states, counties, and school districts. SAIPE estimates help ensure that resources like educational funding, nutrition programs, and healthcare services are directed toward the regions and school districts where child poverty is most prevalent.

3. Link between "places" and other building blocks

Places influence people's opportunities and characteristics, structure social relationships, and shape temporal dynamics. Therefore, there are many ways in which the concept of "places" interacts with the other building blocks proposed by the Friends of the Chair on Social and Demographic Statistics: people, relationships, and time.

- People: This building block addresses stocks, flows, and characteristics of individuals and population subgroups of interest, which are influenced by where people live and work. For example, geographic

factors like urban vs. rural settings directly affect income levels, access to healthcare, and educational attainment. The geographic distribution of populations also reveals patterns of inequality, migration, and social mobility. Geography determines not only the physical location of individuals but also their access to opportunities and resources.

- Relationships: This building block focuses on individual, family, household, community, and societal relationships. The concept of "places" is essential to understanding the relationships between individuals, families, households, and communities. Geography shapes the interaction between communities and their environments. For instance, geographic segregation and residential clustering can significantly influence social relations. Understanding how people are distributed across geographic areas enables analysis of societal structures, such as patterns of family living arrangements, the spatial segregation of communities by race or income, and access to communal infrastructure.
- Time: Together with places are organising elements knitting together the conceptual framework. For example, geographically tagged data can track the life course of individuals or communities over time, identifying how different places influence life outcomes, such as education, employment, and health. Spatial information provides insights into migration flows, urbanization trends, or the effects of climate change over time. Geographically enabled non-traditional data sources (such as satellite imagery) can improve the frequency of statistical production. The temporal context includes how geography impacts access to time-sensitive resources like healthcare in emergencies (e.g., during pandemics or natural disasters).

4. Challenges and gaps

i. Limited technical expertise

Adopting models such as small area estimation or spatial data analysis requires specialized technical expertise not readily available in many national statistical offices. This challenge extends to producing place-based sociodemographic statistics based on GIS and remote sensing.

ii. Resource constraints

Implementing geospatial technologies and integrating spatial data into sociodemographic statistics often requires significant financial and technical resources, such as high-quality satellite imagery and GIS software, and adequate training, which often pose a barrier in resource-constrained settings.

iii. Inconsistent geographic data coverage

In many regions, especially in developing countries or rural areas, geographic data on households, services, infrastructure, and environmental factors may be incomplete, outdated, or non-existent. This lack of comprehensive geographic data can hinder the effective use of geospatial tools in sociodemographic analysis and decision-making.

iv. Data integration and interoperability

Geographic data and sociodemographic data are often collected with different standards, formats, and geographic units. This makes it difficult to integrate and link sociodemographic data with other types of geographic or sectoral data. In addition, there are technical difficulties in the integration of different datasets.

Box 15: Key Considerations for Building a Geospatial Data Architecture

By following these considerations, geospatial data can be systematically incorporated into statistical workflows, leading to more informed decision-making and improved data quality.

- **Collaboration between data users and producers:** Both groups need to engage and develop a shared understanding of the bigger picture. Clearly defining geospatial information needs for statistical production is critical. The production of data should be driven by specific needs, and decision-making should not be made by the mere availability of data.
- **Integrating geospatial data into the broader data ecosystem:** It's important to analyse the entire data ecosystem and ensure that geospatial data becomes an integral part of the overall data architecture. This involves making sure that geospatial data aligns with the objectives of statistical production.

- **Understanding statistical processes across ecosystems:** To fully integrate geospatial data, it's necessary to understand the different statistical processes that exist within various data ecosystems and ensure their compatibility.
- **Information systems and data linkages:** Robust information systems must be in place to effectively link statistical data units with geospatial data. It's crucial to understand how to connect different data sources to create a seamless, interoperable system that supports both statistical and geospatial data integration.

Source: Presentation by Ms. Rina Tammisto, IT Development Manager at Information and Statistical Services, Statistics Finland during the webinar *The critical role of information on "places" and geography to improve social and demographic statistics*

v. Privacy concerns

As data is disaggregated to finer geographic levels, the risk of identifying individual observation units increases. Collecting and utilizing detailed geographic data on individuals or households raises significant privacy and confidentiality issues. Robust methodologies are essential to prevent the disclosure of sensitive information.

5. Opportunities

A summary of the highlights from the webinar, *The Critical Role of Information on 'Places' and Geography to Improve Social and Demographic Statistics*, held on Thursday, 10 October 2024, is provided below.

i. Investment

To ensure the generation of geocoded data, countries are encouraged to actively pursue the use of emerging technologies and innovative methods, while incorporating GSGF and these new approaches into their statistical and geospatial production architecture. Doing so may involve investments in technology, GIS software, and capacity-building for geospatial and statistical analysis as well as data management skills. Exploring innovative solutions to protect privacy while maintaining data utility should also be considered.

ii. Establish and Maintain a Geocoded National Address File

Maintaining a geocoded national address file could significantly enhance the integration of diverse data sources. Such a foundational dataset facilitates the effective linking of administrative records and other data sources, creating a comprehensive geographic framework for social statistics.

iii. Establish and use standards to classify territories and find common geographies for the dissemination of statistics

Adopting common geographies for disseminating data—such as slum areas or indigenous territories—enables the presentation of social and demographic statistics in a way that reflects the distinct characteristics of different regions. Countries should also consider applying international standards like the DEGURBA methodology to classify their territory along an urban-rural continuum.

iv. Foster strong collaboration between data producers and users

Strengthening collaboration between data producers and users across the data value chain can help ensure that data products are better aligned with user needs. Such cooperation fosters a shared understanding of data applications, as producers may not always be aware of the specific challenges faced by users. By working together, both groups can maximize the utility and impact of social statistics.

v. Enhance dissemination and communication approaches

Organizations with extensive data holdings might consider adopting narrative approaches to present their findings more effectively. Contextualizing data to highlight human and social aspects can make it more accessible and engaging for diverse audiences, increasing its impact on social understanding and policy development. Countries could benefit from enhancing their communication strategies and investing in the capacity to analyse integrated sociodemographic data alongside geographic information.

vi. Ensure detailed geographic estimates and assess data quality

Detailed geographic estimates add significant value to social statistics. Countries might take advantage of the growing availability of data and computational techniques, exploring methods like modelling to enhance spatial estimations. At the same time, ensuring rigorous quality assessments across various sources is essential, as data quality can vary depending on its intended use. Efforts to integrate geospatial data should focus on enhancing, rather than compromising, the reliability of statistics across geographic levels. A rigorous quality assessment ensures that data integration efforts enhance, rather than compromise, the reliability of statistics at different geographic levels.

vii. Foster cross-domain cooperation through multidisciplinary teams

Aggregating efforts across different institutions and stakeholders is key to developing comprehensive and coherent geographic datasets. By uniting experts from geomatics, geography, data analysis, methodology, and survey and census management, each specialist can contribute their unique knowledge of challenges, limitations, and specific needs within their field. By fostering collaboration, data producers can ensure that the resulting datasets better meet the needs of policymakers and social planners, enhancing the capacity for data-driven decision-making. This collaborative aggregation strengthens data capacity and fosters innovation in addressing geographic aspects of social statistics.

viii. Accelerate data availability with new Techniques and data Sources

Timelier availability of geographic data is essential to address the limitations of traditional census cycles. Techniques like small-area estimation (SAE) and the use of novel data sources, such as satellite imagery and mobile phone data, can fill gaps in geographic and temporal data. Incorporating these innovative methods into policy and statistical frameworks will help ensure that geographic statistics remain current and relevant.

6. References

United Nations Statistics Division (2024). The critical role of information on “places” and geography to improve social and demographic statistics. Webinar organized by the Friends of the Chair group on social and demographic statistics and UNSD on 10 October 2024.

United Nations (2019), The Global Statistical Geospatial Framework, https://unstats.un.org/unsd/statcom/51st-session/documents/The_GSGF-E.pdf

C. Time[26]

1. Introduction

With the growing complexity of global challenges—such as rapid demographic, climate, and economic changes—social and demographic statistics must adapt to remain relevant, timely, and actionable. In this context, time is more than merely a chronological sequence; it is the lens through which the dynamic interplay of societal trends, population changes, and policy impacts is observed, measured, and interpreted. Time is a crucial factor influencing data collection methods, data integration, and analytical approaches to measure progress on social outcomes and interpret results. Time transforms data from a series of snapshots into a compelling narrative, offering insights into the transitions and interconnections that define the human experience[27].

Time serves as the thread binding demographic events, social relationships, geographical context, and outcomes, enabling a life-course perspective that spans from individual transitions to generational patterns. It illuminates how people's lives evolve in response to policy interventions and societal changes, offering the granularity necessary to address inequalities while honouring the 2030 Agenda's call to "leave no one behind." Embracing time as a multidimensional element—integrating longitudinal studies, trend analyses, and real-time data—will support global efforts to harmonise concepts, methods, and data systems, ensuring statistical relevance in an era of rapid transformation.

Timely sociodemographic data is crucial. The quality of data is closely tied to its timeliness. Outdated information can result in misguided conclusions and ineffective interventions, while up-to-date data enhances decision-making and policy outcomes. Timely and relevant data is also critical for effective resource allocation, ensuring that vital services—such as healthcare, education, and housing—are provided to the populations that need them most.

Alongside the other four blocks—people, places, relationships, and outcomes—the ongoing research on measuring time as a key component of an overarching conceptual framework for social and demographic statistics reflects a commitment to reconciling the trade-offs inherent in modern data collection: balancing the demands for timeliness, accuracy, and resource efficiency while addressing the ethical and methodological complexities of integrating historical, current, and forward-looking analyses.

Box 16: Time as a building block for social and demographic statistics: A Vision for Adaptable and Ambitious System

The task team conducting in-depth research on the building block time, envisions a social and demographic statistical system where time serves as one central organizing principle. This vision emphasizes continuous improvement, adaptability, and ambition, positioning time not merely as a contextual backdrop but as a dynamic, integral component. By leveraging time effectively, social and demographic statistics can adapt to societal changes, offering near-real-time insights while maintaining longitudinal consistency. In this vision, data is collected frequently and aligned with temporal patterns, disseminated promptly to reflect current realities, and analysed in ways that illuminate trends over time, empowering both national and global policy decisions.

However, National Statistical Offices (NSOs) often face significant challenges in embedding time effectively into their systems. To address this, the ideas in this section propose a roadmap for reimagining statistical systems as evolving entities—systems that refine their use of time to connect past, present, and future data. Recognizing the gap between ideal systems and practical constraints, the proposed conceptual framework emphasizes stepwise improvements. This approach guides NSOs toward better integration of time while navigating limitations.

[26] The task team working on the in-depth research of the building block TIME was composed of members from United Kingdom's Office for National Statistics, BPS Statistics Indonesia, the Economic and Social Commission for Asia and the Pacific (ESCAP).) and the United Nations Statistics Division (UNSD).

[27] As highlighted by Stefan Schweinfest during the "*Data on time" – to Strengthen Social and Demographic Statistics* webinar on 17 October 2024,

Flexibility within a shared conceptual vision is also a cornerstone of this framework, allowing NSOs of varying capacities to adopt and adapt best practices incrementally. While aiming to uphold global standards, the framework acknowledges the need for compromises, balancing ambition with pragmatism.

Achieving the "ultimate" statistical system may remain an aspirational goal, yet having a clear vision with ambitious targets is essential. A conceptual framework for social and demographic statistics would serve not only as a guiding vision but also as a practical tool, helping NSOs align their systems with global standards while addressing national constraints. In this framework, time transcends its role as a methodological consideration to become a driver of relevance, coherence, and innovation. It encourages statistical systems to evolve in response to societal needs, providing transparent guidance for decision-making, adaptability, and meaningful progress. By making time an active and central component, the framework fosters statistical systems that are both forward-looking and grounded in the realities of their operational contexts.

Managers within statistical offices should leverage the strategic integration of time into the organization of social and demographic statistics, recognizing it as a key enabler for producing more responsive and adaptive statistical outputs. Ideally, by embedding time considerations into their processes, NSOs can equip policymakers and stakeholders with tools to track social and demographic changes in real-time, addressing disparities and fostering inclusivity. Through cross-domain collaboration, the adoption of innovative methodologies, and a focus on data interoperability, managers can strengthen their organization's capacity to meet complex societal needs while ensuring resilience and agility within the system.

This section advocates for a deeper integration of time into social and demographic statistics, aiming to drive a global shift towards more agile, responsive, and integrated data systems that better reflect the dynamic and multifaceted nature of the modern world. Strengthening the role of time in social and demographic statistics involves addressing several key challenges, such as: What are the best practices for understanding social outcomes across the life course? How does the lived experience of time intersect with calendar time in social statistics? What role do longitudinal microdata and time-use data play in capturing life course transitions and measuring well-being? How should social statistics evolve to reflect societal changes while ensuring consistency? Should the conceptual framework for social statistics include a built-in revision process? How can time measurements better capture generational and contextual differences? What is the optimal frequency for collecting social indicators, and how can we balance timely data needs with resource constraints and respondent burden? Would harmonized data collection intervals enhance international comparability, and what are the feasibility considerations for quarterly time series of key social indicators?

2. Facets associated with time

Time is an organising element that could help in knitting the conceptual framework together, essential for linking each statistical observation to people, their characteristics and events, their relationships, and putting it in a spatial context. Time also provides a lens through which the interconnectedness of social, demographic, environmental and economic phenomena can be understood, emphasising temporal dynamics at multiple scales. This perspective frames time in three distinct but overlapping dimensions: historical, capturing long-term societal shifts; individual life-course, tracking transitions and trajectories within a single lifetime; and family or generational, highlighting intergenerational dynamics and their implications. From the measurement perspective, three facets of time will be described:

- **Time as a variable or Measured Time**: Life events unfold in continuous real time, reflecting personal milestones (such as migration), relationships (like marriage or community belonging), and social outcomes (such as education and health). While these events occur fluidly across an individual's life, social and demographic statistics approximate this reality through measured time. Measured time refers to the discrete intervals or units—such as minutes, days, or years—used to observe, collect, and analyse behaviours, events, and outcomes. Under this facet, life-course and time-use analysis are salient elements.
- **Time as an approach or Contextual Time:** Time is a powerful lens for understanding the interconnectedness of social, demographic, environmental, and economic phenomena, emphasizing temporal dynamics across multiple scales. It helps contextualize three key dimensions: historical, individual, and intergenerational.

- **Time as a system or Data Production Time**: This refers to the characteristics of the statistical process and its outputs. It relates to data quality components such as *timeliness*, *frequency*, and *relevance*, ensuring that social and demographic statistics remain meaningful by adapting to societal changes. It also involves producing and disseminating data in a timely and punctual manner to ensure it remains relevant and actionable.

Each of these facets addresses a critical aspect of how time shapes data collection, analysis, and interpretation. However, while they can be considered individually, they are highly interrelated and must be applied consistently across statistical systems to ensure coherence, accuracy, and relevance. For example, the frequency of data collection directly affects how well we can track changes over the life course, and the ability to adjust definitions and classifications in response to societal changes influences both the frequency and the accuracy of life course data. If these aspects are not harmonised within a statistical system, discrepancies may arise—such as changes in context (e.g. adopting a new definition for migration status) that are not aligned with how data is collected over time. This inconsistency can lead to misleading insights, particularly when users attempt to compare data across different time periods or contexts.

i. Time as a variable or Measured Time

a) Life-course approach

Incorporating a life-course approach into social and demographic statistics is essential for understanding the dynamic interplay of events, behaviours, and outcomes across an individual's lifespan. This approach enables the analysis of how early-life experiences, transitions, and exposures influence outcomes later in life, such as health, education, employment, and well-being. By capturing data at critical life stages and examining longitudinal patterns, policymakers and researchers can identify structural inequalities, design targeted interventions, and promote social policies that support individuals at pivotal moments. A life-course perspective also enhances the ability to address intergenerational dynamics and the cumulative impact of societal and environmental factors, providing a more holistic view of social change and development.

Time serves as both a foundational unit of measurement and a structural element in longitudinal data systems. This approach underscores the importance of capturing data at multiple points across the life course, facilitating the study of transitions, durations, and the sequencing of events in both individual and societal trajectories. When systematically integrated into statistical frameworks, time allows for tracking population dynamics such as aging, migration, and health changes, offering valuable insights into how temporal patterns shape social outcomes and allow for in-depth analyses of changes in well-being, ageing, and social outcomes over decades. This not only supports data collection but also contextualizes it within the flow of time, enhancing its relevance for decision-makers and researchers.

In statistical terms, time acts as a bridge between static snapshots and dynamic analyses, ensuring that data reflects the evolving nature of populations and societal structures. Longitudinal datasets, such as the ONS Longitudinal Study and the Mexican Health and Aging Survey (ENASEM), exemplify this principle by linking data over time to track life-course transitions. These datasets enable comparisons across temporal dimensions, supporting policy evaluation, identifying inequalities, and projecting future needs.

Box 17: ONS Longitudinal Study in England and Wales

The ONS longitudinal study (LS) is a robust longitudinal framework, tracking a 1% sample of the population through linked census and administrative data. Initiated in 1971 the LS provides valuable insights into demographic changes, social mobility, and migration patterns. Its granularity supports detailed analyses of life-course trajectories.

The study covers England and Wales and includes census data from 1971 to 2011, with the 2021 data undergoing testing for inclusion. While household members' data are collected, only sample members are linked across time. Participants enter the sample through birth (if born on a sample date) or immigration and exit through death or emigration, though their data remains available for analysis.

Approximately 500,000-600,000 individuals are included per wave, with over 200,000 tracked across multiple censuses. The LS has several notable strengths. Its large sample size enables the analysis of specific small groups that might otherwise be difficult to study. Long-term tracking supports life-course

analysis, providing valuable insights into changes over time. Additionally, the inclusion of co-resident household data offers a deeper understanding of how family dynamics influence later life outcomes.

Access to the data is limited to accredited researchers working on approved projects, with all outputs subject to stringent disclosure control measures. Certain sensitive variables, such as detailed residential locations, require additional approval and special access. Key research applications include transitions to adulthood, social mobility, access to creative industries and migration trends.

Source: Presentation by Prof Oliver Duke-Williams, Professor of Population Information, University College London during the webinar *"Data on time" – to Strengthen Social and Demographic Statistics*

Box 18: National Survey on Health and Aging in Mexico (ENASEM)

The National Survey on Health and Aging in Mexico (ENASEM) is a collaborative effort initiated with the University of Texas and led by INEGI Mexico, which oversees data collection and processing. The survey aims to provide vital insights into the health and aging experiences of individuals aged 50 and older, addressing critical issues tied to Mexico's demographic dynamics.

Since its inception, ENASEM has conducted multiple waves of data collection, beginning in 2012 and continuing with subsequent waves in 2015, 2018, 2021 and 2024. Each wave introduces new samples to maintain a robust dataset capable of producing reliable estimates despite challenges like high mortality rates among the aging population. The upcoming 2024 wave will expand its scope, including not only participants aged 50 and older but also their household members and partners of any age.

ENASEM employs a range of data collection methods. Data is primarily gathered from direct informants; however, proxy informants are used when individuals are unavailable due to circumstances such as migration or hospitalization. A unique aspect of the survey is its inclusion of information about next of kin for deceased individuals, collected since 2003. This allows researchers to study factors such as disease onset and societal impacts of death. Additionally, biometrics and cognitive assessments have been incorporated into subsamples, notably in 2016 and 2021, to enhance the depth of health-related data.

The survey captures a diverse array of variables, including sociodemographic characteristics, migration history, economic status, lifestyles, time-use data, and health outcomes. Its adaptability has been demonstrated by the inclusion of variables related to the impact of COVID-19 in the 2021 wave, which assessed effects on employment, health, and disabilities. Given Mexico's unique migration dynamics, the survey also tracks migration experiences, including short-term moves, enabling researchers to link life experiences across different contexts.

ENASEM's focus extends beyond health to include social networks, exploring outcomes such as diabetes, obesity, cognitive health, and access to medications. For deceased participants, special questionnaires gather information about their last year of life, providing a comprehensive view of health trajectories and societal implications.

ENASEM continues to adapt and evolve, providing critical insights into health and aging in Mexico while maintaining rigorous standards for data quality, security, and relevance.

Source: Presentation by Mr. Mauricio Rodríguez Abreu, Director General, Sociodemographic Statistics, Mexico's National Institute of Statistics and Geography (INEGI) during the webinar *"Data on time" – to Strengthen Social and Demographic Statistics*

b) Time-use data and analysis

Time is also a valuable and intangible resource that everyone has in equal measure each day—24 hours to allocate across various activities. This universality makes time-use data particularly valuable for cross-national and demographic comparisons. The way time is spent is shaped by factors such as health, energy levels, weather conditions, available resources, social norms, and responsibilities related to both paid and unpaid work. Unlike other assets, time is finite, non-renewable, and cannot be accumulated. Time-use statistics shed light on the daily life of a population in terms of what people do (activities), how much time they spend doing that (duration) and the context of those activities (whom they are with, where they are, who

benefits from what they are doing). Therefore, time-use data offers a comprehensive view of how individuals distribute their time, providing a nuanced measure of the quality of life, particularly by accounting for well-being beyond traditional economic indicators[28]. Time-use data can also be used for linking social, economic and environmental issues. As such, it offers deeper insights into the lived experiences that shape well-being and can be considered the "currency" of life[29].

Box 19: Time-use statistics

Time-use measurements are essential tools for understanding how individuals allocate their time to various activities over a specified period. Typically conducted through 24-hour time diaries or questionnaires integrated into specialized or general household surveys, these measurements capture all activities people engage in and the time spent on each. They offer valuable insights into how societies organize time and how membership in specific social groups shapes individuals' time-use patterns.

To address diverse national contexts and objectives, countries have adopted a range of time-use measurement approaches. As of 2024, at least 113 countries have undertaken time-use studies, highlighting the growing recognition of their importance.

Given the multiple applications of time-use data, ensuring international comparability and quality is vital. To this end, over the past decade, international and regional organizations have made significant strides in developing and aligning standards and guidance for the production of time-use statistics:

- *International Classification of Activities for Time-Use Statistics* (ICATUS 2016):Adopted by the UN Statistical Commission in March 2017, ICATUS provides a standardized framework to produce comparable and meaningful time-use statistics across countries and over time. It categorizes activities based on their productive status, aligning with the System of National Accounts and international labour statistics standards. ICATUS enables detailed analysis of time-use data, supporting diverse research and policy needs.
- *Minimum Harmonized Instrument* (MHI): The MHI offers a streamlined approach to collecting essential background information at the individual and household levels, alongside a list of 25 key activities for a full day. Designed for light diaries or stylized questionnaires, the MHI is instrumental in achieving comparability and facilitating more frequent data collection.
- *Guide to Producing Statistics on Time Use (2024):* This comprehensive guide, endorsed by the UN Statistical Commission, adopts a “basket of options” approach, enabling countries to tailor their time-use measurement strategies to national priorities, stakeholder needs, and resource availability. Complementing the guide is a dedicated time-use resources hub, offering training manuals, analysis tools, dissemination templates, and other resources to support continuous improvements.
- Additional Global Initiatives: Including the *ILO's Labour Force Survey (LFS) Add-On Module* and *UNICEF-supported MICS children's time-use module*, along with accompanying guidance materials, which further enhance the toolkit available for time-use data collection.

Source: United Nations (2004). *Guide to Producing Statistics on Time Use* and UNSD Time-use statistics website

ii. Time as an approach or Contextual Time

Time provides a lens through which the interconnectedness of social, demographic, and economic phenomena can be understood, emphasising temporal dynamics at multiple scales. This perspective frames time in three distinct but overlapping dimensions: historical, capturing long-term societal shifts; individual life-course, tracking transitions and trajectories within a single lifetime; and family or generational, highlighting intergenerational dynamics and their implications.

These temporal dimensions enable analyses that uncover patterns such as the evolution of kinship structures or changes in economic lifecycles. For instance, the study of intergenerational economic flows, as demonstrated through National Transfer Accounts (NTAs), illuminates how resources are redistributed across generations and informs policy responses to demographic challenges like ageing populations. Similarly,

[28] See https://unstats.un.org/UNSDWebsite/statcom/session_55/documents/2024-14-GenderStats-E.pdf
[29] Measuring the Subjective Well-Being of Nations: National Accounts of Time Use and Well-Being

analyses of life-course transitions—such as marriage, migration, or retirement—provide actionable insights into how social outcomes are influenced by both individual choices and systemic factors.

Box 20: Maldives intergenerational dynamics

The Maldives Bureau of Statistics has made significant efforts to measure intergenerational dynamics despite limited longitudinal data, with comprehensive data collection beginning only in 1977 with the census. These efforts have provided valuable insights into changing demographic patterns and family structures over time.

One key area of focus has been the shift in household size and family dynamics. From 1995 to 2022, the average household size decreased from 7.51 to 5.2 people. This change reflects a broader societal shift from extended family living arrangements to more nuclear family structures, especially in urban centres like Malé. This shift has significant implications for how families interact and support one another across generations.

Another important aspect of family dynamics studied by the Bureau is the relationship between family structures and divorce rates. The Maldives has one of the highest divorce rates globally, with only 68% of children living with both parents in 2014. By 2022, this figure had increased to 71%, largely due to government interventions such as new laws and counselling services aimed at reducing divorce rates. However, despite these efforts, the high divorce rate persists, and many children continue to live with only one parent, typically their mother or father.

The Bureau has also focused on elderly living arrangements, with data collection on this issue beginning in 2014. In 2022, it was found that men were more likely to live with their children and spouse compared to women, revealing a gendered difference in elderly living situations in the Maldives.

Source: Presentation by Ms. Fathimath Riyaza, Statistician, Head of Demography & Social Statistics Division, Maldives Bureau of Statistics during the webinar *"Data on time" – to Strengthen Social and Demographic Statistics*

Box 21: Colombia Insights from NTA and NTTA

In Colombia, National Transfer Accounts (NTAs) and National Time Transfer Accounts (NTTAs) are used to track intergenerational economic and caregiving flows.

NTAs capture the generation, consumption, and transfer of resources across age groups, offering essential data to understand economic dynamics and contributions to GDP measurements. By illustrating how resources flow across society, NTAs provide a clearer picture of economic sustainability and intergenerational support systems. For example, children and the elderly typically consume more resources than they produce, while working-age adults are generally net producers of resources.

NTTAs expand on this by incorporating the role of time in economic transfers across the life course. They highlight the increasing pressure on middle-aged adults, particularly women, who bear the burden of caring for dependent populations as life expectancy rises. This demographic shift calls for investments in health and education from early stages of life to ensure balanced economic participation across generations. Additionally, NTTA highlights the caregiving economy, which is largely supported by women through unpaid labour, an essential yet undervalued contribution to society.

By analysing the economic flows, NTAs reveal that most of the paid work is performed by men, while unpaid work, which is crucial to maintaining households and communities, is predominantly carried out by women. This disparity contributes to income gaps between genders. The integration of a gender perspective in NTTA provides insight into how societal norms shape economic contributions over the course of life. When considering the impact of unpaid domestic work, the gender gap in economic contributions narrows, but significant differences remain. The inclusion of time in these frameworks emphasizes the interconnectedness of economic production, consumption, and transfers, showcasing the critical role of both paid and unpaid work in sustaining societal well-being.

Source: Presentation by Mrs. Piedad Urdinola, Director General, National Administrative Department of Statistics (DANE), Colombia during the webinar *"Data on time" – to Strengthen Social and Demographic Statistics*

Box 22: Max Planck Institute for Demographic Research: Global changes in family structures

The Max Planck Institute for Demographic Research (MPIDR) research on global family structures focuses on projecting how family dynamics will evolve in both data-rich and data-scarce countries, employing demographic methods to provide a comprehensive overview of these changes. The research aims to better understand the shifting nature of family structures across diverse contexts, highlighting key trends and implications for the future.

One prominent trend is the shrinking of family size, with the number of relatives (such as siblings, parents, and cousins) expected to decrease significantly worldwide. For instance, in Zimbabwe, a 65-year-old woman had over 80 relatives in the 1970s, but by 2100, this number will drop to just over 30. In addition to shrinking family sizes, there is a shift in family composition. While larger horizontal networks (like cousins) will diminish, vertical kinship networks (including grandparents, great-grandparents, and grandchildren) are anticipated to become more dominant in future family structures. A third trend is the aging of families and generational overlap, driven by increased life expectancy. As people live longer, more generations will coexist, resulting in families where the age gap between individuals and their relatives grows over time. This shift presents unique challenges for family support systems, especially in regions with limited institutional support. Traditionally, families have been a primary source of care, including childcare and eldercare. However, as family sizes shrink and older generations face declining health, the ability of family members to provide care may be diminished. For example, in China, projections show that by 2100, a larger proportion of relatives over 65 will be in poor health, challenging the assumption that they could offer care.

These changes have significant policy implications. In countries with large, shrinking families, particularly in the Global South, there will be a growing need to invest in formal support systems. Preparing for a future where family-based care is less viable will require governments to prioritize institutional support structures to meet the needs of aging populations.

Source: Presentation by Mr. Diego Alburez-Gutierrez, Group Leader, Kinship Inequalities Research Group, Max Planck Institute for Demographic Research (MPIDR) during the webinar *"Data on time" – to Strengthen Social and Demographic Statistics*

A temporal approach enriches the understanding of interconnected data by placing it within broader societal contexts, such as historical trends or generational shifts. Therefore, time is not only a measurement variable but also a critical component in designing research and interpreting its findings, bridging the micro-level experiences of individuals with macro-level societal changes.

iii. Time as a system or Data production time

This aspect of time highlights the crucial balance between the frequency of data collection and dissemination, and the contextual adaptability of statistical practices. By addressing both the operational and conceptual dimensions of time, statistical systems can better respond to societal changes while maintaining methodological consistency. A well-functioning statistical system integrates time across operational frequency and its ability to reflect societal contexts. Operationally, this means updating social and demographic data regularly and in close to real time, ensuring timely policy responses. Conceptually, it requires flexibility to accommodate new definitions, societal shifts, and updated classifications, all while preserving the integrity of historical datasets. Such a system also acknowledges that time plays a significant role in the public's trust in statistics. As new methods, such as administrative-based data, emerge, transparency and rigor in data collection and integration become even more critical. Balancing these operational and contextual factors ensures that statistics remain both relevant and actionable.

It is important to distinguish between timely (up-to-date) data and data collected frequently. While economic indicators can often be updated promptly, demographic and social data, such as census or time-use data, can quickly become outdated, creating gaps in policy-relevant information. Advancing toward more timely social data is essential, and innovative methods like nowcasting and leveraging technology offer promising solutions.

Moreover, while many social and demographic trends remain stable and may not require frequent updates, some shifts occur rapidly and benefit from more regular data collection. For example, the Canadian Social Survey, which provides quarterly indicators on key social issues, allows for more effective tracking of these changes.

Box 23: Canadian Social Survey

In response to the rapid changes brought on by the COVID-19 pandemic, including shifts in health, social cohesion, relationships, and the economy, Canada's National Statistical Office (NSO) adapted quickly by investing in surveys that could deliver timely data. One such initiative was the launch of the Canadian Social Survey (CSS) in spring 2021. This voluntary survey targets individuals aged 15 and older across most of Canada, excluding the northern territories, and aims to provide essential social data.

One of the core frameworks guiding the CSS is the Quality of Life Framework, developed by Statistics Canada in collaboration with the international community. This framework measures societal progress beyond traditional economic indicators like GDP, capturing a broader picture of the nation's well-being.

Historically, there was an assumption that social statistics changed infrequently, and therefore did not require frequent data collection. This view, which assumed changes in social indicators were primarily noise in otherwise stable data, has been challenged by the CSS findings.

The CSS has revealed significant social trends, most notably a steady decline in life satisfaction across Canada. For example, the proportion of Canadians reporting high life satisfaction (rated 8 to 10 on a scale) fell from 54% when the survey began to 49% in early 2023. The survey also highlighted variations in life satisfaction trends by age group, with seniors maintaining stable levels of satisfaction, while adults aged 25 to 34 experienced a decline, largely attributed to affordability challenges, especially with housing.

Racial disparities in life satisfaction were also evident, with racialized Canadians reporting a greater decline in satisfaction—five percentage points annually in 2021—compared to less than one percentage point for non-racialized Canadians. Although specific factors such as discrimination or unfair treatment were not directly measured, the data suggests these may be contributing factors.

Moreover, the CSS demonstrated a clear link between financial hardship and life satisfaction. Among Canadians facing financial difficulties, fewer than three in 10 reported high life satisfaction, with a two percentage point annual decline. In contrast, those not facing financial hardship reported high life satisfaction at over 60%, with satisfaction levels increasing over time.

The time series data collected by the CSS provides valuable insights into directional changes in social well-being, revealing that social conditions can indeed evolve over time. This data has proven essential for tracking the experiences of different population groups and offering early warning signals for shifts in societal trends.

Source: Presentation by Ms. Lauren Pinault, Chief of the Centre for Social Data Insights and Innovation, Statistics Canada during the webinar *"Data on time" – to Strengthen Social and Demographic Statistics*

3. Link between "time" and other building blocks and statistical domains

i. Linking time with other building blocks

Time serves as a knitting element that connects and contextualises the four other building blocks—People, Relationships, Outcomes, and Places—by embedding temporal dimensions into the structure and analysis of social and demographic statistics. Time enhances these blocks' ability to provide meaningful insights into how societal dynamics evolve and interact over life courses, generations, and geographical contexts.

a) People and Time

Time provides a longitudinal perspective that allows for tracking changes in individual and population characteristics over life stages, from birth to old age. It enables the study of demographic trends, such as ageing, migration, and fertility, and their temporal implications for resource allocation, policy development,

and societal planning. Frequent, time-sensitive updates to population data ensure timely and actionable insights.

b) Relationships and Time

Relationships are fluid, evolving over time as individuals transition through life stages, form households, and experience societal changes. Time captures the dynamic nature of these connections, shedding light on intergenerational dependencies, caregiving patterns, and the temporal impact of events like marriage, divorce, or migration on relational structures. Temporal data helps illuminate the shifting quality and function of relationships, critical for understanding well-being and societal resilience.

c) Outcomes and Time

Outcomes, whether social, economic, or environmental, are best understood through a temporal lens that captures changes and trends. Time facilitates the analysis of life-course outcomes, such as educational attainment, employment trajectories, and health statuses, highlighting disparities and opportunities for targeted intervention. Tracking these outcomes over time enables policymakers to evaluate the long-term effectiveness of interventions and adjust strategies as needed.

d) Places and Time

Time enriches place-based statistics by linking geographic data to temporal trends, revealing how social and demographic phenomena unfold in specific locations over time. It supports the integration of spatial and temporal data to address questions like how migration patterns affect urban development or how access to resources evolves in rural areas. This intersection is vital for creating location-sensitive policies that respond to dynamic societal needs.

By connecting these building blocks, an overarching framework enables cohesive system capable of capturing the complexity of interconnected societal phenomena. This alignment facilitates holistic analyses, improves the adaptability of statistical systems, and supports policies designed to address both immediate and long-term challenges.

ii. Time facilitates integration across statistical pillars

While the description of time focused on being a building block for social and demographic statistics, time is inherently linked to other statistical pillars, such as economic and environmental statistics. For instance, understanding the relationship between economic cycles and population migration trends requires an integrated approach where time is aligned across different datasets. Similarly, environmental changes, such as climate-induced migration, necessitate a coherent framework where time-related social statistics can be integrated with environmental data. An effective statistical system should facilitate the interoperability of time-based data across domains, allowing NSOs to provide a more complete picture of societal dynamics. The ability to integrate time effectively across domains will enhance the relevance of social statistics in addressing global challenges, such as inequality, sustainability, and migration.

4. Challenges

i. Data availability and quality

a) Complexities of longitudinal data analysis

Longitudinal datasets provide critical insights into life-course transitions but face inherent challenges. Participant attrition, institutionalization, high mortality rates and evolving societal dynamics complicate the maintenance of longitudinal datasets over decades. Studies like ENASEM face difficulties tracking aging participants and needed innovative approaches, such as using proxy informants or expanding data collection strategies, to sustain participation and data quality. A key trade-off in longitudinal data collection is between achieving a rich, large sample size with multiple data linkages and maintaining high data quality. Rich datasets, like the ONS LS, provide valuable insights into life-course transitions but can introduce errors in data matching and inconsistencies across sources, such as administrative records, health, or education data. Similar challenges arise in panel surveys, where inconsistent variables and population mobility heighten the need for resource-intensive data harmonization efforts.

Additionally, disentangling age, period, and cohort effects is particularly difficult, as shifts in health or social mobility may reflect aging processes, historical periods, or generational characteristics. Multicollinearity, resulting from repeated measures of strongly correlated variables like income or caregiving patterns, further complicates analyses. Advanced methods such as structural equation modelling or ridge regression are necessary to address these issues but demand high technical expertise and computational resources, potentially limiting widespread application.

b) Trade-offs between timeliness, frequency and accuracy

Quality is a fundamental dimension of any statistical system, and balancing the demands for timeliness, frequency, and accuracy presents ongoing challenges. Administrative data offer significant opportunities for more frequent and timely updates, such as monthly social indicators, enhancing the responsiveness of statistical systems. However, these models may lack the comprehensive coverage of traditional surveys and censuses, especially for transient populations, undocumented migrants, or individuals not actively engaged with public services, which can introduce biases in population estimates. While administrative data offers more immediate insights, it also requires careful integration and methodological adjustments to address these gaps. By prioritizing accurate validation and error-checking, it is possible to leverage the strengths of administrative data while maintaining the reliability and robustness needed for effective decision-making.

c) Data comparability and historical consistency

Integrating emerging societal concepts, such as non-binary gender classifications or new migration statuses, challenges the consistency of long-term time series. Reconciling updated methodologies with historical records requires meticulous validation to preserve the reliability of trend analyses while maintaining public trust.

The pace of adaptation in statistical systems often lags behind societal changes, as the introduction of new classifications demands rigorous validation, which can delay implementation. The ONS Revisions Policy highlights the importance of responsible adjustments to historical datasets, demonstrating how updates can be made transparently to ensure both modern relevance and historical integrity.

Poor communication of changes risks undermining public confidence, particularly when revisions to historical series appear arbitrary. Transparent explanations and careful alignment of adjustments with past trends are crucial to maintaining credibility and trust.

d) Emerging trends and technological evolution

The integration of advanced technologies, such as machine learning and big data, introduces new opportunities and complexities in governance, quality assurance, and ethics. While these innovations enhance analytical capabilities, they also risk amplifying biases inherent in administrative datasets or private-sector data sources like social media. Maintaining equity and transparency in public data systems remains a pressing challenge.

ii Public acceptability and ethical concerns

Data collection and its use involve significant ethical considerations that influence public trust and the acceptability of statistical systems. Concerns about privacy and data confidentiality have grown with advanced data collection methods, such as data linkage and the use of big data from private sources. Public trust is crucial for participation in surveys and the acceptance of administrative data.

Longitudinal studies, which track participants over decades, amplify fears of data profiling and breaches of confidentiality, despite anonymization efforts. Ensuring informed consent and maintaining transparency about data use is key as well as strict encryption and adherence to national statistical laws to protect participant confidentiality, with access limited to legally permissible datasets.

Moreover, while the life course perspective provides valuable insights into individual trajectories, it has been critiqued for focusing predominantly on the individual, often overlooking the role of social structures like economic systems, cultural norms, and public policies. Integrating structural analyses into life course research would offer a more holistic understanding of social outcomes, considering both individual and societal factors.

Building public trust requires transparent communication, clear governance structures, and evidence that personal data is being handled ethically and securely. Without these assurances, public resistance could undermine the feasibility of integrating administrative records into more frequent statistical updates.

iii Resource constraints

The integration of administrative data and maintenance of longitudinal datasets require continuous investment in infrastructure, staff training, and technical tools. Processes like data linkage, validation, and harmonization demand both advanced expertise and operational capacity. For instance, systems like the ONS Longitudinal Study (ONS LS) face delays due to the intensive efforts needed to ensure data quality and accuracy, reducing the timeliness of insights critical for policymaking.

Countries with limited resources face additional pressures as they strive to balance investments in long-term initiatives like panel surveys and demographic shifts with addressing urgent public data needs.

Sustaining modern statistical systems involves ongoing resource demands. Unlike traditional periodic censuses, admin-based systems, for example, require continuous updates, data harmonization, and rigorous quality assurance. The need to prioritize between maintaining legacy systems and investing in innovative methods exacerbates financial and operational pressures, particularly in developing contexts.

iv Lack of harmonized frequency for the production of social and demographic statistics

Differences in the frequency of data collection also exacerbate disparities. Some countries update population statistics annually, whereas others rely on decennial censuses, creating gaps that hinder cross-national analyses of demographic trends.

5. Opportunities

Several promising solutions have been identified drawing on current practices from National Statistical Offices.

i. Leveraging administrative data for more frequent updates

A key solution for addressing timeliness concerns is leveraging good quality administrative data to provide frequent and accurate population estimates and social statistics. For example, the ONS Population and Migration Statistics Transformation Programme integrates administrative datasets to produce more frequent publications, aiming to move towards monthly population estimates with minimal delay. By enhancing data linkage techniques, this approach ensures consistency and reduces biases often seen in census-dependent systems. The Maldives Bureau of Statistics also demonstrates the utility of administrative data in tracking intergenerational dynamics and informing long-term social policies.

To expand the effectiveness of this approach, it is critical to invest in improved data harmonisation, pilot testing integrations of survey and admin-based methods and enhancing data governance structures.

ii.Ethical frameworks and public engagement in longitudinal data

For future research using life course approaches, robust ethical frameworks and public trust-building strategies are vital. The ONS Longitudinal Study (LS) offers a leading example of managing privacy concerns while providing rich insights into life-course trajectories. Similarly, the ENASEM in Mexico emphasises the importance of ethical review processes to ensure that linked longitudinal datasets respect participant privacy and maintain public trust. While the UK's 2017 Digital Economy Act provides a legal basis for sharing data across government departments for statistical purposes, the act does not automatically eliminate concerns about privacy and data misuse. Public consultations and transparent communication campaigns can enhance understanding of the benefits of data sharing while alleviating fears about misuse.

Key steps include strengthening ethical oversight, improving public communication about safeguards, and actively involving citizens in decisions about data use to ensure long-term participation and trust.

iii. Responsive revision policies and concept integration

In a healthy statistical system, revision policies are crucial for ensuring the systems remain responsive while maintaining historical coherence. Transparent revision processes and stakeholder engagement further bolster the credibility of these updates. Promising practices include developing clear frameworks for integrating new concepts, ensuring stakeholder validation of revisions, and maintaining transparency in explaining updates to both users and the public.

iv. Innovations in technology and resource allocation

Emerging technologies such as real-time analytics, machine learning, and enhanced data processing techniques provide opportunities for faster updates and improved data quality across all themes. Integrating private-sector data, like mobile phone or social media data, can supplement official statistics but requires robust governance and clear ethical frameworks. Sustained investment in staff training, technology infrastructure, and cross-sector collaboration is essential to support these advancements.

By adopting these solutions, statistical systems can balance timeliness, quality, and societal relevance while navigating ethical and operational complexities.

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D. Relationships[30]

1. Introduction

People do not survive in isolation; they are social creatures that are constantly interacting with and exist in relation to one another. Families and household groupings, communities, and institutions are salient features of understanding the social landscape. Interactions between individuals collectively build up a society (Friends of the Chair group on social and demographic statistics - Workstream 2: Promising Practices for Social and Demographic Statistics).

"Relationships" encompass human interactions with one another, including ongoing close ties, such as familial bonds, and social connectedness. Such interactions are difficult to unpack, given their complex, multi-faceted nature. Even so, they are a foundational aspect of human experience and what make us "social". Moreover, with individual people as the 'unit of measurement' of demographic and social statistics, relationships play an architectural role in social statistics. Social statistics are often structured into groupings based on relationships; for example households, communities and states. Nevertheless, there has been little in the way of efforts to date to systematically consider how social and demographic statistics should treat relationships, so this work is essential to the Friends of the Chair group on social and demographic statistics mandate to strengthen this statistical pillar to better reflect society, as well as its connections with the environment and the economy.

Relationships are intrinsically and extrinsically valuable and vary across population groups, time, and place. Evidence across domains – public health, economics, criminology, and others – serves as a starting point both to establish the centrality of relationships, and to frame our thinking about their implications for social statistics. Relationships are multi-level and multi-dimensional.

- **Multi-level:** Relationships occur – and matter for human well-being – at micro (personal, family, household), meso (community, workplaces, schools), and macro (societal institutions, governance, national, global) levels.
- **Multi-dimensional:** The extent, function, and quality dimensions of relationships—and their outputs—significantly impact well-being at the individual, community, and societal levels, and this has implications for how relationships should be considered from a measurement perspective.

Much like many social statistics indicators, relationships are not standardized in terms of their associated concepts and definitions. Under the umbrella of the *Relationships* exist numerous related concepts. Annex D.1 provides a list of concepts related to relationships. The goal of this section is to better understand why we need to measure relationships as part of a comprehensive social statistics pillar, what we know about relationships based on a review of academic literature and work by a sampling of multilateral and domestic institutions, and how relationships are already measured across national statistical systems. This research also aims to explore what more we need to know about relationships, and how we might frame relationships within a framework for social and demographic statistics.

2. Elements of the Building Block

Strong evidence on the criticality of relationships for well-being, broadly defined, has emerged within multiple domains, particularly health. There is a growing body of research on, public health, adult development, relational well-being and social cohesion, and efforts to build a guiding conceptual framework for measuring relationships should draw on that evidence.

The single longest in-depth longitudinal study of adult life, the Harvard Study of Adult Development, has followed people from 734 families through their entire lives; beginning in 1938. This uniquely rich data source, which takes includes objective physical health measures as well as subjective experiences, has established that the strongest predictor of longevity and freedom from the preventable diseases of aging (e.g., cardiovascular disease, arthritis, or diabetes) in your 80s was a person's satisfaction with their personal relationships. With repeated observations over time and results from other scientific studies representing a

[30] The task team working on the in-depth research of the building block RELATIONSHIPS was composed of members from Statistics Canada, the Haut-Commissariat au Plan Morocco, the OECD Centre on Well-being, Inclusion, Sustainability, and Equal Opportunity (WISE) and the United Nations Statistics Division (UNSD).

fuller range of subpopulations, they also found that "people who are more connected to family, to friends and to community are happier and physically healthier than people who are less well-connected" (Waldinger and Schulz, 2023, p. 21).

Dr. Julianne Holt-Lunstad is professor of psychology and neuroscience and Director of the Social Connection & Health Lab, Brigham Young University, and founding scientific chair and board member for the U.S.-based Foundation for Social Connection and the Global Initiative on Loneliness and Connection (GILC). Her work has established the public health relevance of "social connection"—an umbrella term for the structure, function and quality of social relationships—positioning it on a continuum, in which low social connection produces risk and high social connection offers protection (Holt-Lunstad, 2022). There is clear evidence supporting those public health implications; Hold-Lunstad cites an extensive, multi-disciplinary literature showing that, despite various definitions and approaches to the measurement of social connection, the results converge, and there are documented effects on mental, cognitive, and physical health outcomes including mortality.

These and other findings are discussed in further detail in Annex D.2. The goal of this researchis to provide not an exhaustive review of the literature available but, rather, an overview of key bodies of work from which supporting evidence for elements of a conceptual framework can be drawn. Some of the research cited refers to work by expert participants in a September 26, 2024 "sprint" webinar hosted by the Friends of the Chair group on social and demographic statistics titled: *"Exploring Social Relationships and Connectedness"* to distill existing evidence on relationships and why they matter to well-being, as well as measurement considerations and best practices. While these bodies of work take different approaches to understanding the role of relationships in wellbeing, there are several common elements. This work serves as a starting point to consider how a conceptual framework for measuring relationships would sit within an overarching conceptual framework for social and demographic statistics, concurrently under development.

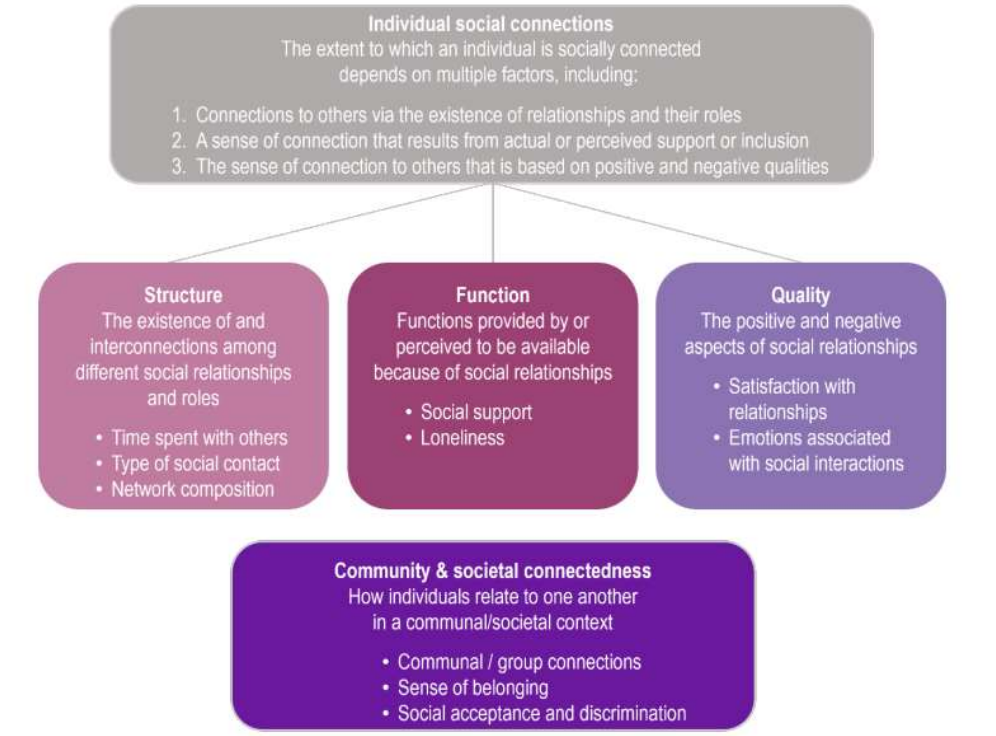
Based on the review of literature and engagement with members and experts to date, a common understanding is beginning to emerge to frame relationships from a measurement perspective in social statistics. The proposed relationships measurement builds upon the work of the OECD Centre on Well-Being, Inclusion, Sustainability and Equal Opportunity (WISE), the SOCIAL Framework, the social-ecological model, measures of relationships, social connection, and social cohesion on household surveys at Statistics Canada, and measures developed by the UNECE Task Team on Social Cohesion. For more details on the research foundations for framing the measurement of relationships see Annex D.2

Box 24: OECD - Social Connections Review and Conceptual Framework

The Organisation for Economic Co-operation and Development (OECD) is prioritizing the measurement of social connections, with a report released in September 2024 (OECD, 2024). Based on the extensive research reviewed, the OECD cites the importance of social connections (adopting the umbrella term that refers to the many ways that people interact with and relate to one another) and the variable's impact on health, wellbeing, the economy and labour market, education, social mobility, and resilience, to name a few examples. This includes the impacts of positive social relationships and the harmful aspects of social isolation (spending little time with others, infrequently engaging in social interactions, and/or having a small social network) and loneliness (an individual's perception of being isolated, or from feeling that their needs are not being met in their relationships with others). The report underscores the importance of social connectedness in communities, society, and governments, and the growing recognition that is being paid by OECD countries to promote policies that can support social connectedness.

This OECD exercise harnesses the multi-dimensional nature of social connectedness by adapting the conceptual framework developed by researchers Holt-Lunstad, Robles and Sbarra (2017). As indicated in the diagram below, four dimensions are included: structure (existence of social relationships, roles and interactions), function (actual or perceived support provided by people's relationships), quality (positive and negative aspects such as relationship satisfaction, closeness, strain, conflict), and communal and societal connectedness (how individuals relate to one another and to larger group entities in the broader societal context).

Figure: The OECD's proposed model for measuring social connections



Note: Example indicators within each box are meant to illustrate measurement approaches, they do not constitute a comprehensive list of all approaches to measuring a given topic.

This proposed approach to thinking about measuring relationships should be nested within an integrated framework for social statistics, though further design work would be required to elaborate this, as the approach to measuring relationships is still under development at the international level, in parallel with the development of strategic recommendations towards a conceptual framework for social and demographic statistics by the Friends of the Chair group.

In the overarching conceptual framework for social and demographic statistics, people serve as the unit of measurement in social statistics as individuals move through time and place. Relationships look at interactions among and between people. Figure 2 shows how the building block relationships is integrated amongst the other building blocks.

Figure 2: Towards a multilevel and multidimensional measure of social relationships

PEOPLE (Unit of measurement for social statistics)						
People interact in Multi-dimensional **RELATIONSHIPS**						
RELATIONSHIPS ECOSYSTEM						
Measurement Dimension	**Relationship Level**					
	Micro			**Meso**		**Macro**
	Individual	*Household*	*Family*	*Community*	*Sector/ Institution*	*Society/ National/Global*
Extent - stock (how many); characteristics (proximity, similarity, diversity, etc.)	e.g., # of friendships	e.g., household composition	e.g., marital status, presence of children, intergenerational relationships, siblings, parenthood	e.g., community groups and organizations, neighbours	e.g., connections with colleagues and supervisors, student to student connections, teacher to teacher connections, connections from extracurriculars, roommates	e.g., in-group relationships, between-group relationships
Function - activity, service	e.g., social and emotional support	e.g., caregiving	e.g., child-rearing	e.g., provision of local amenities/supports, community disaster support	e.g., education	e.g., governance, social support programs
Quality - condition (e.g., weak/strong, close/far, positive/negative, unifying/polarizing);	e.g., someone to count on; perception of relationship strain	e.g., satisfaction with division of household chores	e.g., satisfaction with relationships; marital quality	e.g., sense of belonging to community	e.g., skills	e.g., confidence in institutions
Impact – intrinsic evaluations, extrinsic valuations (e.g., discrimination, social inclusion/exclusion are possible impacts of positive and negative relationships)	e.g., Perception of availability of emotional, informational, tangible, or belonging support;	e.g., household economies of scale	e.g., generational wealth transfers	e.g., community safety/socio-economic opportunities such as local schools	e.g., earnings	e.g., peace and economic stability
Interactions/Relationships between People occur in **PLACES** (Physical) and Spaces (Virtual); complexity associated with flows (mobility, evolution over time)						
Interactions/relationships between People occur in **TIME** (across the lifecycle (childhood, youth, adolescence, adulthood, elderly); from transitory interactions to life-long bonds); complexity associated with flows (Frequency, Duration, Contextual Era)						

Relationships should be measured at three proposed levels, including the micro (individual, household, and family), meso (community), and macro (society). These levels not only allow for users to evaluate the whole of society, observing things like levels of social cohesion and how institutions are functioning, but also allow for the evaluation of individuals, households, families, and communities, and their associated interactions. In addition, statistics on relationships should capture four dimensions, including extent (stock – the number of relationships – and characteristics), function (activity, service), quality (the condition of relationships), and impact (intrinsic and extrinsic valuations of relationships). These dimensions support the evaluation of why relationships matter and the value of measuring them, to help users pinpoint the functions relationships serve, the quality of interpersonal relationships, and the extent to which they impact outcomes and serve as outcomes themselves.

Box 25: Statistics Denmark's register of potential caregivers and new trends of couples
(Example: Micro Level/Extent Measurement)

Statistics Denmark is currently looking into relationships for two main reasons: the increased caregiving burden being observed on the social welfare system and the changing nature of relationships being observed amongst couples. For context, Denmark has a social welfare system where the state operates as the primary caregiver. However, in recent years, the system has seen a steep increase in utilization to the point of strain. To better monitor and inform this concern, Statistics Denmark is establishing a register of potential caregivers, based on administrative registers with individuals and households data and their associated relationships. The register will identify partners, parents, children, children-in-law, grandparents, and grandchildren - and potentially a future inclusion of other informal relations. Developing the register will foster the provision of well-structured data on the relationships between family members and may also uncover the geographical distance between the individuals in the register. The caregiving register will be completed in 2026, where the number of relationships that individuals have will be revealed, and the associated microdata will become available for further research and analysis.

In addition to the caregiving register, a register on couple relationships will be created to evaluate the changing nature of relationships amongst couples over time (ex. married couples, and couples living apart). Fundamental changes in relationships amongst couples are being observed. For instance, women are getting married and are having children much later in life, with this increasing trend in age being observed since 1980. Based on changes being observed, Statistics Denmark is pulling information from existing registers to combine data on individuals and households to reveal the changing nature of relationships over time, and how couple dynamics are shifting.

At Statistics Denmark, administrative registers enable them to look at different types of relationships, particularly between relatives, with full coverage and at a relatively low cost. This data can be shared with statisticians and researchers for further insights to be revealed. The caveat is that they are unable to capture the quality and function of relationships and more work needs to be done. However, thanks to the newly created couples register, the NSO has been able to capture the number of couples who are living apart, which is a new facet of data that has yet to be revealed up until this point.

Source: Presentation by Mr. Peter Vig Jensen, Head of Division, Population and Education, Statistics Denmark during the webinar *Exploring Social Relationships and Connectedness*

Box 26: Statistics Canada social survey relationships measures
(Example: Micro and Meso Level/Quality Measurement)

Canada's Quality of Life Framework possesses numerous social indicators that relate to relationships. The measures fall into the Society domain of the framework under the social cohesion and connections sub-domain and include:

1. Sense of belonging to local community

This indicator is defined as the proportion of the population by strength of sense of belonging to their local community. This indicator is measured through the Canadian Social Survey where respondents are asked "How would you describe your sense of belonging to your local community?" and can select the

response category on a scale starting from “very weak” to “very strong.” The measure is also collected on the Survey Series on People and their Communities (SSPC), the General Social Survey (GSS) - Social Identity, the Canadian Community Health Survey (CCHS), the Canadian Housing Survey (CHS) and the General Social Survey (GSS) - Canadians' Safety (Victimization). Question wording varies across these surveys.

2. Someone to count on

This indicator is defined as the proportion of the population by frequency with which they have people they can depend on to help them when they really need it. This indicator is measured through the Canadian Social Survey, the Survey Series on People and their Communities (SSPC), and in the General Social Survey (GSS) - Canadians at Work and Home where respondents are asked “How often would you say you have people you can depend on to help you when you really need it?” and can select the response category never, rarely, sometimes, often, or always.

3. Trust in others

This indicator is defined as the proportion of the population by trust in others and is measured primarily by the General Social Survey (GSS) – Social Identity, in addition to the Canadian Social Survey, and the Survey Series on People and their Communities (SSPC). There are three questions posed to respondents which can be viewed on the hyperlinked indicator hub page.

4. Satisfaction with personal relationships (family and friends)

This indicator is defined as the proportion of the population by level of satisfaction with their personal relationships (e.g., with family members and friends). The indicator is collected through the Canadian Social Survey and the General Social Survey – Canadians at Work and Home where respondents are asked “on a scale from 0 to 10, where 0 means you feel "Not at all satisfied" and 10 means you are "Completely satisfied": How satisfied are you with your personal relationships?”

5. Loneliness

This indicator is defined as the proportion of the population by frequency of feeling lonely and is collected on the Canadian Social Survey and the Survey Series on People and their Communities (SSPC). On both surveys, respondents are asked “how often do you feel lonely?” and respondents select the response category always, often, sometimes, rarely, or never.

In addition to the initiative led by Statistics Canada, other efforts are underway across the country to measure social relationships. To learn more please see Annex D.3

Box 27: UNECE Task Team – Measures of Social Cohesion
(Example: Macro Level/Quality and Impact Measurement)

In 2022, an in-depth review of social cohesion concepts was undertaken for the United Nations Economic Commission for Europe Conference of European Statisticians (UNECE CES). Statistics Canada presented at the plenary session in June 2023 and, following this conference, a task team on social cohesion was established, with Statistics Canada appointed as its Chair. The task team became responsible for delving deeper into between-group research for social cohesion, and the affective distance between different ideological groups. What the researchers deduced in their work is that there is plenty of research that measures the distance between identity groups, but less so when it comes to measuring the distance between ideological groups. As such, understanding these divisions across groups with conflicting views and values became a priority to research.

To bridge this gap, in September 2023, Statistics Canada launched a study on social cohesion dimensions and group sorting through the 2020 General Social Survey (GSS). Additionally, to fill data gaps, new thermometer questions on feelings towards those with similar/different political views, views on racism, and views on gender identity were added to the Survey Series on People and their Communities (SSPC) Wave 5. One key finding observed, based on affective polarization disorder, is there is a known strongly positive feeling towards in-groups but that negative feelings can be tied towards members of out-groups. Another key takeaway from analyzing this new data on social cohesion was that solely measuring people’s in-groups overlooks antagonistic relationships between members of out-groups, so both must be measured

when evaluating social cohesion. Overall, more research needs to be done on clusters of individuals, and measures for identifying fracture points in society need to be prioritized for sustained and timely collection and dissemination. Prioritizing these social cohesion measures will help to sustain health and resilience as society experiences shocks, with evidence-based decision-making driving better outcomes.

In September 2024, the task team presented to the Conference of European Statisticians Bureau a report providing a conceptual measurement framework and exploring national data collection practices relating to social cohesion, including recommendations for further work. In addition, the Task Team has produced an inventory of questions on between-group ties, identified in household surveys fielded by selected national and international statistical agencies.

Source: UNECE (2024). Measuring Social Cohesion [online: https://unece.org/statistics/documents/2024/10/working-documents/measuring-social-cohesion]

3. Link between "relationships" and other building blocks of the social statistics pillar

i. Relationships and People

People are connected through relationships, whether that is with other individuals, friends, family, households, or communities, to name a few examples. People are the component ingredients of relationships. Through which exchanges take place that serve a wide variety of functions – from child-rearing and care to workplace and market interactions. The quality of these relationships matters as well; social connections can be established and create the architecture for how these relationships are structured and function. People also have network effects on which relationships form and whether they're sustained over time and have an influence on the quality of those formed relationships. As such, people form the foundation upon which relationships are built. Births, deaths, and migration also impact the transience of relationships over time. These measures can be tracked through census, population registers, household surveys, or administrative data.

Uruguay's Data Warehouse (see Box 7) can integrate administrative data sources, including population, business, and real estate registers, all linked through unique identifiers such as personal and business ID numbers. The system also integrates censuses and household surveys. If each individual is a "cell" in the model illustrated in Box 7, relationships are both combinations of these cells (e.g., households, communities) as well as the connections *between* the individual cells; forming networks. Social network analysis is discussed further in the Annex of this report. This model provides inspiration for how relationships could be modelled in a system for social and demographic statistics.

At Statistics Estonia (see Box 1), they have developed methodology to identify connections between individuals to determine which people are likely to live together through being married, having a child together, and having a mortgage together, for instance. This serves as another example where people and relationships are linked, as the NSO is predicting the likelihood of people living together based on the structure of people's relationships.

In connection with people and relationships, Holt-Lunstad's research serves to highlight the growing dangers of isolation for radicalization and extremism. Given that social connection and a sense of belonging are such fundamental human needs, if an individual is devoid of these two aspects of social health, they may be motivated to seek out connection and belonging in unhealthy ways[31]. For instance, those who feel lonely and isolated from society are more likely to become targets for radicalization and extremism (Holt-Lunstad, Relationships Sprint, 2024). This could lead to negative outcomes, especially in a world where there are increasing issues of misinformation and trust in the media, and where people are now exposed to AI-generated content devoid of public disclaimers.

ii. Relationships and Time (life course approach)

Relationships relate with the Time building block as they evolve over time throughout the life cycle. While some relationships are sustained from birth to death, others are transient and situational, and the frequency

[31] Dr. Julianne Holt-Lunstad during the webinar Exploring Social Relationships and Connectedness, 26 September 2024

and quality of relationships often change as people age. For instance, in order to develop your identity and learn social skills it is crucial that you engage with a larger number of people when you are younger. By contrast, as you get older it makes sense to prioritize fewer relationships and put more effort into them to improve their quality because you are more assured of who you are and what you like, and you also have less free time for socializing due to adult responsibilities. Even as social relationships change over time, in terms of their frequency and quality, one study found that the quantity of social interactions at age twenty and the quality of social interactions at age thirty predicted social integration, friendship quality, loneliness, depression, and psychological well-being at age fifty (Carmichael, Reis & Duberstein, 2015).

In the Harvard Study of Adult Development, which collected data on respondents for over 80 years, the researchers discovered that the strongest predictor of longevity and freedom from the preventable diseases of aging in your 80s was a person's satisfaction with their personal relationships. The study also served to highlight the importance of the time dimension in relationships as they fluctuate and change over the life course. Waldinger and Schulz note that life stages can be looked at "...through the lens of our relationships. Because human life is essentially social when major changes deeply affect us, our relationships are usually a central element of what's in flux" (Waldinger and Schulz, 2023, p. 61). This observation highlights the central role of relationships in people's lives and how people's social connections and relationships shift based on their life stage. Time also connects with relationships in the way that people use their time to socialize and connect with others.

As described in Box 22, the Max Planck Institute for Demographic Research MPIDR research evaluates changes in relationship structures over time, including historical time (i.e., calendar year), the life course, and family time (ex. generations, genealogical positions, being a grandparent, a child, parent, etc.). This work uses demographic methods to produce projections of family structures over time, including global changes in family structures. In many parts of the world, family members are important sources of informal support. In countries where institutional support is not readily available or well-funded, kids or cousins contribute to childcare and old age support. This has implications for service provision and the increased needs that will ensue for the state.

For instance, in China, there is a growing aging population (people aged 65 and older) in comparison to younger age groups, with adults currently having fewer children and kin than in the past. In the future, older relatives are projected to be increasingly unhealthy and will be less of a support for dependents and become the ones who need more support themselves. For example, older relatives will not be as able to provide caregiving to their grandchildren and will require more caregiving from their own children to support their needs. This has implications for the provision of support and services, as it showcases the need to proactively invest more in support services starting now.

iii. Relationships and Place

ArcGIS[32] and other GIS software enable data users to link relationships to places by mapping relationship measures against different geographies and observing how outcomes vary. Additionally, mapping tools and satellite imagery can estimate a person's distance to a health facility, for instance, or denote mobility patterns of people in their communities, which highlights the connections people have with their built environment, and the services to which they have access, as highlighted during the sprint *"Building modern and resilient population data systems to enhance data quality, improve cost efficiency and policy relevance"* including specific small area estimation geospatial mapping examples using WorldPop data[33]. There appears to be an opportunity here for the mapping capability to be able to expand to showcase how people connect with one another and interact in their communities, providing relevant data on social connections from a structural element standpoint, such as the number and frequency of connections who cross paths within the community

[32] In the case of ArcGIS, users can map two patterns within a single map to enable visualization, and this is done through a technique called bivariate choropleth mapping, whereby two-colour ramps combine into a grid-like legend, displaying the resulting pattern combination (Berry, 2023).

[33] Prof. Andy Tatem, Professor of Spatial Demography and Epidemiology at the University of Southampton and Director of WorldPop

evaluated. Access to spaces also influences people's ability to connect (ex. access to virtual spaces, social media, internet connection).

iv. Relationships and Outcomes

As uncovered throughout this report, relationships have objective impacts on health and well-being, in addition to the economy. Having positive, high-quality relationships not only has protective effects in terms of health and economic outcomes, but they also serve as outcomes in and of themselves – e.g., trust in others as a measure of social capital, or having someone to count on. There are several examples of how social relationships have an influence on people's health, well-being, vitality, survival and longevity.[34] Ultimately, more work needs to be done to standardize and harmonize concepts and measures so that we can seek to analyse and compare outcomes on a national and international scale and reveal where disparities exist and where interventions are warranted.

Box 28: The WHO Technical Advisory Group on Social Connection
(Example of Multilateral Policy and Measurement Emphasis)

Based on the widespread prevalence of social isolation and loneliness, affecting 1 in 4 people worldwide, the WHO established a Technical Advisory Group on Social Connection (TAG-SC) to work to resolve the issue by increasing awareness and signalling the prioritization of policy interventions. The advisory group comprises roughly 20 members, representing diverse perspectives, industries, skill sets, and academic fields from across the globe. These members serve to advise the World Health Organization (WHO) on social connection and its effects on society and health through a multi-faceted lens. The TAG-SC provides technical advice in several areas including:

1. Bringing social connection to the forefront, in terms of political visibility and prioritization, and evaluating the determinants and mechanisms that can be identified to position the social issue as a public health problem that affects people worldwide;
2. Generating the technical content associated with social connection;
3. Developing the Global Index on Social Connection, and identifying the ideal forms of measurement, including instruments, scales, data sources, modes of data collection, and analysis methods, to yield regional, national, and global estimates, including estimates from the Global South;
4. Reviewing and identifying the most effective interventions to mitigate social isolation and loneliness and promote social connection, with solutions that can be scaled nationally and internationally;

Creating an effective communications strategy to best present the issue, including through the use of different media.

Source: WHO TAG-SC. Technical Advisory Group on Social Connection (TAG-SC). https://www.who.int/groups/technical-advisory-group-on-social-connection-(tag-sc)

[34] Kasley Killam's research emphasizes the vital importance of social health and relationships and their protective effects against illness, inflammation, acute and chronic diseases, and mortality (Killam, 2024). In a systematic review and meta-analysis conducted by Valtorta et al. in 2016, which evaluated the impact of social relationships on cardiovascular disease and stroke, the researchers found that poor social relationships are linked to a 32% increased risk of having a stroke, and a 29% increased risk of developing cardiovascular disease (Valtorta, Kanaan, Gilbody, Ronzi & Hanratty, 2016). Furthermore, a meta-analysis conducted by Jaime Vila (2021), which summarized over 1100 studies featuring 1.5 billion participants around the world, found that people who have weak social health were 11% to 53% more likely to die from any cause. In a similar vein, a 2023 systematic review and meta-analysis of 90 cohort studies, that examined the health outcomes of over 2.2 million people aged 18 years or older, found that those who were isolated or lonely had a significant cause of all-cause mortality (Wang et al., 2023). The Harvard Study of Adult Development reveals that people's social connectedness played a significant role in adding years of disability-free life to their existence compared to people in the study who were more isolated and disconnected- over time (Waldinger, Relationships Sprint, 2024). Researchers like Dr. Holt-Lunstad have even gone so far as to reveal that, in comparison to other risk factors for death, lacking close relationships has a comparable effect of smoking cigarettes regularly, being physically inactive or obese, and drinking alcohol in excess (Holt-Lunstad, 2017; Holt-Lunstad, Robles, & Sbarra, 2017).

Box 29: Statistics Canada's relationship and health measures
(Example of Domestic Measurement Practices)

Statistics Canada Statistics Canada's population health statistics program and its household survey-based data sources include relationship measures. Many of these surveys feature structural measures of household composition, household relationships, and marital status, and also include measures of sense of belonging. The flagship annual Canadian Community Health Survey (CCHS), and less frequent mental health and access to healthcare surveys, include a Social Provisions module asking respondents to indicate to what extent they: have close relationships that provide them with a sense of emotional security and well-being; have someone to talk to about important life decisions; have relationships where their competence and skills are recognized; feel part of a group of people who share their attitudes and beliefs; have people to count on in an emergency.

The Canadian Community Health Survey, Mental Health (CCHS-MH) includes measures of positive mental health such as belonging to a community (like a social group, your neighbourhood, your city, your school) and having warm and trusting relationships with others, as well having people to count on in times of stress. The Canadian Health Survey of Children and Youth (CHSCY) asks youth a series of questions to gauge loneliness (feel you have no one to talk to, feel left out, feel alone); the person most knowledgeable about the child selected for the survey is asked about parent-child interactions (for example, talk or play with each other, laugh with each other and so forth) and questions are included on family functioning (such as in times of crisis we can turn to each other for support). The Canadian Health Survey of Seniors (CHSS) also includes questions on loneliness (how often they felt a lack of companionship, were left out, isolated from others) as well as on social participation barriers (felt wanted to participate in more social, recreational or group activities and what prevent that) and care receiving (type of care and from whom).

It is important to underscore the fact that while social relationships can operate as predictors of outcomes, such as those outlined above, they can also operate as outcomes themselves. For instance, social relationships serve as outcomes by way of being influenced and shaped by an individual's personal and situational characteristics. A person's individual characteristics and situation stand to impact the types of relationships people need or seek, the types of social support people exchange, and the ways in which people initiate, develop, maintain, and end relationships across their life span (Antonucci, Langfahl, Akiyama, Lang & Fingerman, 2003).

4. Link to the economic and environmental statistical pillars

Relationships not only have impacts on social health and well-being but also have critical objective economic impacts. Social isolation among older adults alone is costing the U.S. federal government $6.7 billion annually in Medicare spending and lonely workers are costing the U.S. economy around $406 billion in lost productivity (Weissbourd Batanova, Lovison & Torres, 2021; Killam, 2024; Killam & Richards, 2022). People spend the majority of their waking hours at work, so the literature finds that those who are socially connected in a positive way with colleagues have better outcomes, such as lower turnover rates, increased productivity, and less absenteeism, which yields positive economic outcomes for the employer.

The concept of social capital has been directly applied to understanding economic outcomes. For instance, recent analyses on how different types of social capital might impact economic mobility, and children's chances of moving up the income distribution.[35]

Relationships and social connections are influenced by the natural and built environment. For instance, access to green space, community gardens, community centres, and walkable neighbourhoods create entry points for social connection to occur. In neighbourhoods where natural assets like green space are available, there are greater opportunities for people to run into each other and to experience social connection through

[35] Chetty et al. (2022), for example, recently used Facebook data on 21 billion friendships to explore how different types of social capital might impact economic mobility. They define three measures of social capital from their Facebook dataset: 1. network connectedness or the extent of friendships between different types of people such as those from different socioeconomic status (bridging capital) 2. network cohesiveness or the extent of friendship network cliques (bonding capital) and 3. civic engagement such as rates of volunteering. Economic mobility was measured as children's chances of moving up the income distribution.

the shared communal spaces. In terms of the natural environment and built community environment, there is evidence to suggest that more socially connected communities have lower crime and violence rates and also higher resilience when shocks to the community occur (Holt-Lunstad, Relationships Sprint, 2024). For instance, as communities face any number or kinds of crises, whether that's a natural disaster or hazard (fires, floods, earthquakes), there's evidence to illustrate that better connected communities are more resilient when these shocks occur and are better able to recover from these shocks (Holt-Lunstad, Relationships Sprint, 2024). Studies have shown that the extent to which you know your neighbours can influence whether you survive some of these crises because it's often your neighbours who are there before your first responders. Much like saving costs for the employer with increased positive social connection between employees in the workplace, being socially connected with your neighbours has positive implications for the economy, as people are able to rely on each other within their own community, rather than relying more heavily on public services which could be under strain during times of crisis.

5. Challenges and Gaps

Relationships cover a broad spectrum of human-to-human interactions, and this poses challenges for their conceptualization and measurement. They are complex, multi-dimensional, multi-level and shaped by varying contexts, including personal and societal conditions. Further, relationships serve as outcomes themselves as well as pathways to other outcomes (Waldinger & Schulz, 2023). The complexity of relationships as a building block of social and demographic statistics requires an intentional approach to measurement guided by a rigorous conceptual framework.

Current studies are typically limited by including only binary measures or measures that target only one dimension of relationships (Holt-Lunstad, 2022). Such approaches are not sufficient to capture the complexity of relationships and may result in misleading results (Holt-Lunstad, Relationships Sprint, 2024). For example, focusing only on the structure of relationships misses the impact of the quality of relationships. At the same time, setting priorities for measurement where space in existing data collection vehicles is limited could be hampered by the need for multifactorial conceptualization and measurement of social relationships.

While there are promising conceptual frameworks that could guide or be adapted to facilitate the measurement of relationships (see Holt-Lunstad, 2022; OECD, 2024 as examples) they are not yet widely adopted and applicability for the global north and global south must be determined. There is a proliferation of terminology/concepts used to describe "relationships," as is noted in Annex D.1. This requires sorting through the nuances of related terms and determining which aspects are relevant to measurement contexts.

Box 30: Morocco's High Commission for Planning measures of relationships and challenges
(Example of Domestic Approach to Strengthening Measurement Practices)

To measure social connectedness, Morocco has developed a few strategies coupled with improved digitalization of statistical processes, including for their 2024 Census. Morocco is planning to conduct its new edition of surveys on family and on time use, with related modules on social inclusion, participation, sense of belonging, and isolation using both subjective and objective approaches. This new data will update existing ones on social relationships (structural and functional) by context and domain, as well as current and future standards for social concepts, like those found in 2012-well-being survey and used by domain in the Labour Force Survey, Violence Against Women Survey, business surveys, among others.

Currently, Morocco is also setting up a social integration register to provide a more inclusive and efficient approach to understanding households. Even with this work underway, however, there remain outstanding challenges. For instance, based on the multitude of different concepts and measures for social connectedness, social relationships, and social cohesion, there is a need to harmonize concepts, methods, and measures, with a balance of comprehensiveness and feasibility for national and international comparisons. Additionally, linking data sets remains a challenge, as Morocco lacks the required legal framework to do so, as well as common identifiers for the linkage, and resources.

Source: Presentation by Mr. Oussama Marseli, Chief Statistician at High Commission for Planning, Morocco during the webinar *Exploring Social Relationships and Connectedness*

The proliferation of terminology/concepts and the absence of international standards leads to a lack of harmonised data on relationships. As outlined in the OECD working paper, *Measuring social connectedness*

in OECD countries, all OECD countries are measuring aspects of social connectedness but the measurement approaches in use are not harmonized (OECD, 2024). As a result, there is no one-stop shop for indicators agreed upon nationally/internationally for the measurement of relationships. Work towards a global index of connectedness is currently in progress but has yet to be completed.

Box 31: OECD – Mapping of measures of social connections
(Strengthening Future Measurement)

To improve social connectedness, the OECD posits a clear need for a better evidence base, including more cohesive definitions and measures of the aspects of social connections that are most important to wellbeing, and more robust data showing trends and inequalities. To do so, the OECD is advancing this measurement agenda by mapping a selection of household surveys run by national statistical offices and international surveys to pinpoint how social connections are currently being measured and which methods should be considered for proposed harmonization.

Through the lens of this framework, OECD experts have systematically mapped questionnaire items in 43 national and nine international household surveys against their adapted conceptual framework of structure, function, quality, and community social connectedness. Ultimately, this mapping exercise will play a key role in identifying the optimal measures of social connectedness and pinpoint how increased concept and measure harmonization can be achieved.

Source: OECD. (2024). "Measuring social connectedness in OECD countries: A scoping review", OECD Papers on Well-being and Inequalities, No. 28, OECD Publishing, Paris, https://doi.org/10.1787/f758bd20-en.

Data currently collected on relationships are not timely (OECD, 2024). While there is ample evidence for the policy imperative of collecting data on relationships, particularly given their impact on health outcomes, measurement is infrequent often at 2–5-year intervals. Underlying assumptions of the pace of social change may be one factor inhibiting more timely measurement along with a lack of resources for more frequent measurement.

It is not clear how information on social connections can be actioned by policy makers particularly given the complexity of measurement. This lack of clarity, as Holt-Lunstad (2022) points out, is at least partly due to inconsistent measurement approaches and the resulting absence of comparable data. When there is such diversity in the concepts and measures of social connections available it is not clear where the problems lay or what viable solutions may exist to address them (Holt-Lunstad, 2022).

Box 32: Global Initiative on Loneliness and Connection (GILC)
(Example of Potential Applications at the Macro Level)

The Global Initiative on Loneliness and Connection (GILC) is dedicated to eradicating the pressing issues of loneliness and social isolation. This initiative serves as a promising solution to support the spread of national, system-wide approaches to strengthen social connection in society

Source: Global Initiative on Loneliness and Connection. GILC -Home. https://www.gilc.global/

Consideration will need to be given to technology's impact on social relationships and how that will shift outcomes in the future, as technology and related tools continue to rapidly advance (OECD, 2024). Further, consideration will need to be given not only to the physical places but also to the virtual spaces within which social relationships occur and the impacts of these, positive and negative.

Several groups are working on the same task at hand – defining and measuring relationships and social wellbeing (OECD, WHO Commission, FOCG-SD as examples). While some coordination efforts are underway, clarity on leadership and roles could create synergies and avoid unnecessary duplication.

6. Next steps

The task team working on the in-depth research of the building block Relationships has identified possible next steps, contingent to the Group discussion and approval:

- Based on available resources and time, continue the study of relationships under the auspices of the Friends of the Chair group on social and demographic statistics, other relevant multilateral organizations that influence standards for social statistics, and National Statistical Offices. This may include:
  - determining how measurement of relationships fits in an overall conceptual framework for social and demographic statistics,
  - identifying further promising practices,
  - focusing on practical and implementation considerations,
  - providing high-level advice on how measurement of relationships fits in an integrated data infrastructure for social and demographic statistics,
  - outlining connections to other building blocks; and,
  - demonstrating the policy relevance of potential social statistics outputs related to relationships.
- Acknowledging that high-quality, well-functioning relationships across micro-to-macro levels of society can themselves be an outcome (as well as a determinant of better outcomes such as health outcomes); include social connectedness as an outcome domain (e.g., trust in others, sense of belonging, loneliness and social isolation, social cohesion, confidence in institutions, social capital).
- Identify, articulate and pilot test among the Friends of the Chair group members the components of a multilevel and multidimensional measure of social relationships (see Figure 2) that is internationally relevant. This work should draw upon promising research and practices noted above, adapting as required and collaborating with experts working within this space.
- Pursue collaborative work with the OECD, UNECE, NES, Expert Group on Well-being Measurement (EGWM), WHO Commission on Social Connection, and others as appropriate to work towards a shared understanding of how relationships and social connectedness should be understood and measured.
- Work towards standardized terminology recommended by the Friends of the Chair group for use in social and demographic statistics regarding relationships and social connectedness.
- Seek to identify, validate, and test a minimum viable set of measures of social connectedness, or establish a priority sequence for NSOs to consider. This effort aims to enhance the measurement and understanding of relationships in social statistics, with initial guidance on mechanisms NSOs could explore for integrating these measures into future social data collection plans.
- Explore and identify innovative longitudinal and mixed methods approaches for a life course analysis of relationships along with opportunities offered by alternative data sources, linkages, and big data analytics tools such as network analysis.
- Also acknowledge interconnectedness with other building blocks, e.g.:
  - Relationship “units”, comprised of aggregated groups of people are often used to understand statistics about people (e.g., micro: household, family) and places (e.g., meso: community, region; and macro: nation) and to disaggregate analysis of outcomes for distributional insights (e.g., distribution of household incomes, place-based differentiated social conditions).
  - From a temporal perspective, interactions, and relationships between people, and between individuals and the relevant meso and macro level bodies in their lives, can range in a continuum from transitory to life long.
- Acknowledge interconnectedness with the economic and environmental pillars of statistics, and the complexity associated with understanding the role of relationships, which will take time to elaborate.
- Recognizing that the Friends of the Chair group on social and demographic statistics is time-bound, consider an appropriate successor strategy/mechanism and collaborative approach between existing streams of work to advance follow-up work on measurement of relationships within the social statistics pillar, noting the earlier recognition about alignment with other multilateral efforts.

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8. Annex

Annex D.1: Examples of concepts and definitions of relationships

Concept	Definition
Social interaction	A social interaction is where an individual acts toward another individual using some form of communication, to which the other individual responds (Lindsay, 2023).
Social relationships	One-on-one relationships with immediate family, friends, and partner(s) (Source: The Art and Science of Social Connection by Kasley Killam).
Social connection	The extent to which an individual is socially connected depends on multiple factors, including: 1. Connections to others via the existence of relationships and their roles 2. A sense of connection that results from actual or perceived support or inclusion 3. The sense of connection to others that is based on positive and negative qualities (Holt-Lunstad, 2022). The experience of positive relationships with other people, and a primary psychological need and motivator (Killam & Richards, 2022).
Social connectedness	The structural and functional aspects of social relationships that make up an individual's perception of meaningful and reciprocal connection with others; the experience of belonging and relatedness between people (Van Bel, Smolder, IJsselsteijn & De Kort, 2009). Social connectedness reflects the continuum of meeting social connection needs. It is the degree to which you have the number, quality, and variety of relationships that you want. It is when you feel like you belong and have the support and care that you need.
Social cohesion	Represents the multiple ways in which individuals connect to others emotionally, behaviourally, and physically. Current measurement approaches include three broad categorizations that assess very different aspects of social relationships: structural, functional, and qualitative indicators of social connection (Holt-Lunstad et al. 2017; Holt-Lunstad, 2018). The fabric that knits society together; a latent concept that can only indirectly be measured through constituent dimensions (i.e., interpersonal trust, shared values) (MacIsaac, Relationships Sprint, September 26, 2024).
Social capital	The value stemming from social networks and their associated norms of reciprocity (Putnam, 2001). An individual's social networks – such as family, friends, and associates – are an asset that have value for their own sake and that can be leveraged for various means such as assistance during a crisis and/or for material gain (Woolcock, 2001).
Bonding social capital	Bringing together people who are like one another in important respects (ethnicity, age, gender, social class, etc.) (Putnam & Goss, 2002). Refers to relationships amongst members of a network who are similar in some form (Putnam, 2000).
Bridging social capital	Bring together people who are unlike one another (Putnam and Goss, 2002).

	Refers to relationships amongst people who are dissimilar in a demonstrable fashion, such as age, socio-economic status, race/ethnicity, and education (Szreter and Woolcock, 2004).
Linking social capital	The extent to which individuals build relationships with institutions and individuals who have relative power over them (e.g., to provide access to services, jobs or resources) (Woolcock, 2001; Szreter and Woolcock, 2004).
Loneliness	The subjective, unpleasant experience of perceiving a deficiency in the number and/or quality of relationships with other people. (Killam & Richards, 2022).
Social isolation	The objective experience of having few social relationships, group memberships, and/or social interactions (Killam & Richards, 2022).
Social fitness	Social life is a living system in need of exercise. Keeping relationships in good shape (Waldinger & Schulz, 2023).
Social health	The aspect of overall health and well-being that comes from connection (Killam, 2024) (Source: The Art and Science of Social Connection by Kasley Killam).
Social inclusion	The process by which efforts are made to ensure equal opportunities – that everyone, regardless of their background, can achieve their full potential in life. Such efforts include policies and actions that promote equal access to (public) services as well as enable citizen's participation in the decision-making processes that affect their lives (United Nations DESA Programme on Social inclusion).
Social network	Consists of actors (e.g., persons, organizations) and some form of (often, but not necessarily: social) relation among them (Brandes, Freeman & Wagner, 2013). "1. a network of social interactions and personal relationships. 2. a dedicated website or other application which enables users to communicate with each other by posting information, comments, messages, images, etc." (Oxford Languages)
Social wellbeing	The dimension of health that is derived from connecting with other people and feeling a sense of community and/or belonging (Killam & Richards, 2022).
Relational wellbeing	Individuals are relational subjects whose connections and interactions with others and with their social contexts shape their wellbeing.
Social prescribing	A means for trusted individuals in clinical and community settings to identify that a person has non-medical, health-related social needs and to subsequently connect them to non-clinical supports and services within the community by co-producing a social prescription—a non-medical prescription, to improve health and well-being and to strengthen community connections (Muhl, Mulligan, Bayoumi, Ashcroft, & Godfrey, 2023).

Annex D.2 Research underpinnings for a conceptual framework for measuring relationships

a) Harvard Study of Adult Development – relationships across the life course

The Harvard Study of Adult Development is the single longest in-depth longitudinal study of adult life. Researchers have been conducting the study since 1938 with 734 families, following people throughout their entire lives and taking measurements over time. These include physical measurements like blood pressure or cholesterol alongside measures of social relationships and subjective experiences. This uniquely rich data source has established how critical relationship quality is to individual's quality of life and longevity.

After the first generation, the researchers decided to go back and assess individuals in their mid-life to determine the strongest predictors of longevity, happiness and health. This was an "aha!" moment: they found that the strongest predictor of longevity and freedom from the preventable diseases of aging (e.g., cardiovascular disease, arthritis, or diabetes) in your 80s was a person's satisfaction with their personal relationships. With repeated observations over time and results from other scientific studies representing a fuller range of subpopulations, they also found that "people who are more connected to family, to friends and to community are happier and physically healthier than people who are less well-connected" (Waldinger and Schulz, 2023, p. 21).

The Harvard Study of Adult Development assessed the number of people study participants saw in a given week or month, but they also evaluated the warmth of those connections and the sense of belonging people reported in those relationships—measuring both their objective and subjective characteristics. The quality and from a measurement perspective, the subjective experience of relationships matters, not just the raw number of connections, or our living arrangements, or our marital status: "Simply put, living in the midst of warm relationships is protective of both mind and body" (Waldinger and Schulz, 2023). For example, they found that people in more satisfied relationships did not experience the same drops in happiness on days when they felt more pain, and that those participants who were most satisfied with their relationships at age 50 were the healthiest, mentally, and physically, at age 80. Importantly, those subjective measures revealed tremendous variability in the objective number of connections a person wants in their life. For instance, those who are more introverted may need relatively few relationships to maintain their wellbeing and longevity, while those who are more extroverted may need many more.

Why do relationships have such an impact on physical and mental wellbeing? The best hypotheses these researchers have, based on their data, concern stress and stress reduction. Positive, warm relationships are stress regulators. When we experience stress on a daily basis, our relationships can regulate it through mechanisms as simple as a hug, which has a physiological calming effect. Our stress responses should subside when the stressor is removed, but the Harvard Study found that people who are isolated or lonely have higher circulating levels of cortisol, take longer to heal from wounds and surgery, and have more cardiovascular issues. Each body, alone, cannot absorb all the stress we experience—we must diffuse that burden through our social network to make it light enough to bear. If the most powerful active ingredient of social relationships is their capacity for stress reduction, though, it poses a problem for measurement, given their multi-factorial nature.

Relationships do not merely exist but can serve a variety of functions; they meet our own needs in a variety of ways and through relationships, we serve the needs of others – a process of giving and receiving. Waldinger and Schulz (2023) identify several functions served by relationships: safety and security, learning and growth, emotional closeness and confiding, identity affirmation and shared experience, romantic intimacy, help (information and practical), and fun and relaxation.

Furthermore, the Harvard Study showed how our lives are shaped by various types of relationships including those with intimate partners, family, friends, and work colleagues. It is not only the structure of these relationships that matters. "The essential point is that close, nurturing units of people that have a formative effect on our lives can come from a variety of places, include a variety of people, and be called any number of things. *What matters is not just who we consider to be family, but what our closest relationships mean to us over the course of our lives.* (Waldinger and Schulz, 2023, p. 202-203). The Harvard Study unpacks the types of relationships and the impacts they have, positive and negative, on health and happiness. The power of friendships is but one example. They found that men who served in combat who had more positive friendships with their fellow servicemen and who were members of a cohesive service unit were less likely to experience symptoms of PTSD after the war (Waldinger and Schulz, 2023).

There are time and place dimensions to relationships. Adult development, the growth process, unfolds throughout the lifecycle. In fact, life stages can be looked at "...through the lens of our relationships. Because human life is essentially social, when major changes deeply affect us, our relationships are usually a central element of what's in flux" (Waldinger and Schulz, 2023, p. 61). Our relationships, the roles we play within them, and our views of life, shift and change depending on where we are at in the life cycle, our life stage (Waldinger and Schulz, 2023). The connection between relationships and time is not limited to the life course but extends to how we use our time and whether we are present or distracted within our relationships. Our "social fitness," the time and attention we give to our relationships is connected to happiness (Waldinger and Schulz, 2023).

The places and spaces within which we engage with others are also important. The need to understand how we use virtual spaces and physical places to engage with others and their impacts was made clear during the Covid-19 pandemic when global shutdowns physically isolated us from one another. "Suddenly it became clear that schools, movie theatres, restaurants, and ballparks weren't just about learning, watching movies, eating food, and playing sports. They were about being together" (Waldinger and Schulz, 2023, p.280). Where and how we gather, the impact of global crises, the effects of social isolation and the fundamental need for

human connection to help us face life challenges was evident in the pandemic context (Waldinger and Schulz, 2023).

b) Public health research and conceptual framework for social connection

Dr. Julianne Holt-Lunstad is professor of psychology and neuroscience and Director of the Social Connection & Health Lab, Brigham Young University, and founding scientific chair and board member for the U.S.-based Foundation for Social Connection and the Global Initiative on Loneliness and Connection (GILC). Her work has established the public health relevance of "social connection"—an umbrella term for the structure, function and quality of social relationships—positioning it on a continuum, in which low social connection produces risk and high social connection offers protection (Holt-Lunstad, 2022). There is clear evidence supporting those public health implications; Hold-Lunstad cites an extensive literature showing that, despite various definitions and approaches to the measurement of social connection, the results converge, and there are documented effects on mental, cognitive, and physical health outcomes.

Mortality studies provided strong evidence, for example, that social isolation significantly predicts higher risk of premature all-cause mortality after accounting for other factors, including demographic, lifestyle, biological, and health risk factors. Research has shown a prospective association between social connection and mortality, even controlling for other risk factors such as age or health status, that is at least comparable to other known risk factors—including lifestyle and environmental or clinical risk factors. Holt-Lunstad (2022) also cites longitudinal studies of cardiovascular outcomes showing that poor social relationships predict a 29% increased risk of coronary heart disease and a 32% increased risk of stroke. But longitudinal data have also shown the importance of social connection for cognitive health. For example, higher social engagement and larger social networks are associated with better global cognitive function. Poor social networks increased the risk of dementia by 59%, while greater social engagement was a protective factor (Holt-Lunstad, 2022). Mental health has also been shown to be strongly associated with social connections : poor social connections are associated with social anxiety, depression, and suicidal ideation, while greater social connection is associated with better mental health (Holt-Lunstad, 2022).

While epidemiological studies showcased the importance of relationships for vitality and physical health outcomes, the academic research—and public perception—seemed to lag behind in recognizing this link. This led Dr. Holt-Lunstad and her colleagues to carry out a meta-analysis to pinpoint the link between relationships and mortality and determine why it was so under-recognized. It included 141 studies, one of which was the Harvard Study of Adult Development, and it found that across all measures, positive relationships led to an increase in survival. But they wanted to identify why this link was not being taken more seriously, and what they discovered was the lack of a common language to discuss and explain the concept of relationships. As a result, Dr. Holt-Lunstad and her colleagues have worked to identify common themes and elucidate a common language including the umbrella term, social connection.

Social connection and its three constituent elements provide a way to conceptualize relationships. The structural element captures the existence of and interconnections among different social relationships and roles (i.e., marital status, social networks, social integration, living alone, and social isolation). The functional element describes the functions provided by—or perceived to be available due to—social relationships (i.e., received support, perceptions of social support, and perceived loneliness). The quality element identifies the positive and negative aspects of social relationships (i.e., marital quality, relationship strain, and social inclusion or exclusion). Most of these measures are on a continuum, apart from a few categorical measures such as living alone or marital status.

Holt-Lunstad (2022) also points to a growing body of research showing the importance of social connections across the life cycle. Studies have shown that the prevalence of loneliness spans the life cycle and may peak among young adults; prospective studies provide evidence that isolation, loneliness and living alone predicts premature mortality across ages; and there is evidence that biological processes such as the development of childhood immune processes are influenced by warmth and rejection in their social environment (Holt-Lunstad, 2022).

With the knowledge that resources are constrained across the globe when it comes to data collection and dissemination, Dr. Holt-Lunstad cautions against selecting certain measures – for example, just loneliness, which has a particular public policy salience at the moment – over others. From her earlier meta-analyses, Dr. Holt Lunstad observed that the majority of studies were principally focused on measuring the structural

elements of social connection, such as whether an individual lives alone or in a household with other people. However, if structure is the only element measured, data producers lose valuable information on the function of those relationships, like whether a person can be relied upon. If someone were to score high on the structural measures and policy makers then assume that they are protected, the individual may not be granted the resources they need to obtain the support they may not be gaining from their social network. Similarly, if we place too much emphasis on the structure of relationships, lacking attention to relationship quality, and the intervention recommended is to increase the frequency of contact with an individual, this could lead to deleterious effects if this increased contact is with someone who increases conflict, strain, and stress.

Many researchers and data producers have placed an interest in solely using loneliness to measure social connection. Conceptually, loneliness has often been used as a catch-all term to encompass all the ways in which people lack connection—but there is a major risk in using this one measure to capture all social connection. Loneliness can occur if anyone lacks one of the main components (i.e., structure, function, quality) but what Dr. Holt-Lunstad and colleagues determined in their research is that the concept is far too narrow and does not fully represent social connection. For instance, while loneliness is a predictor of mortality, it is the lowest predictor, even compared to social isolation. As such, while there is a widespread policy demand for social connection measures, and while resource constraints exist, there is a need to improve the language, conceptualizations, and methods of social connection and to avoid focusing too narrowly on one all-encompassing measure if we are to avoid missing out on influences on social connection.

Not only does Holt-Lunstad and colleague's work (2017, 2022) bring together evidence supporting the importance of social connections to public health and health outcomes, but it also offers a way to conceptualize social connections and proposes a more integrated public health framework for systemically considering social connections. The SOCIAL Framework (Systems of Cross-Sector Integration and Action Across the Lifespan) was developed by the Foundation for Social Connection's Scientific Advisory Council chaired by Dr. Julianne Holt-Lunstad. The SOCIAL Framework is presented as a more systemic way to bring together evidence, surface evidence gaps, and influence public health through integrating socio-ecological models of health prevention with sector models of health policy and with a life span approach (Holt-Lunstad, 2022). The framework relies on two existing models, the social-ecological model (outlined below) and the Health in All Policy (HiAP) framework, to underscore the role every segment of society has to play in the reduction of social isolation and loneliness, and the promotion of social connection across the lifespan (Krombach, Peavey, Wilkerson & Barth, 2024; Holt-Lunstad, 2022; Holt-Lunstad, 2018).

Taking a systems approach, individuals are viewed as existing within a network of four dimensions that, while separate, also interact. These dimensions include the individual, the family and close relationships, the community, and the society (Holt-Lunstad, 2018). To support population health interventions, the SOCIAL Framework comprises of four main domains including:

1. **Structure** (existence and interconnections among differing social ties and roles),
2. **Function** (actual or perceived support provided by social relationships),
3. **Quality** (positive and negative aspects of social relationships) and,
4. **Multi-Dimensional** – (complex measures of social integration; how individuals relate to one another and to larger group entities in the broader societal context) (Holt-Lunstad, Robles and Sbarra, 2017).

In addition to the four main domains, the SOCIAL Framework offers guidance for population health intervention through four additional components, including:

1. **Levels of influence** (individual, interpersonal institutional/organizational, community, and societal levels)
2. **Sectors of society** (education, health care, transportation, housing, work, nutrition, environmental supports, and leisure)
3. **Cross-cutting themes** (represent issues that must be addressed across all levels and sectors represented in the framework such as lifespans, evidence, diversity, and equity)
4. **Opportunities for collaboration** (acknowledge and encourage approaches that operate across many sectors and disciplines) (Holt-Lunstad, 2022).

Table 1 showcases measures that have been used across the domains of social connections defined within the SOCIAL Framework.

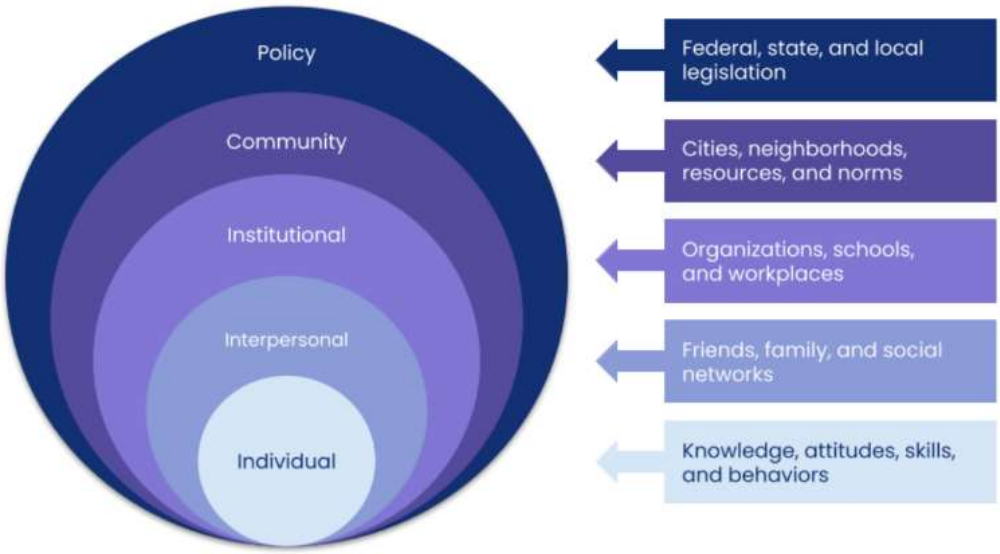
Table 1: SOCIAL Framework Measures

Domain	Domain definition	Measures
1. Structural	The existence and interconnections among differing social ties and roles.	Marital status • Married • Divorced • Widowed • Never Married Social networks • Density or size • Number of social contacts Social integration • Active engagement in a variety of social activities/relationships • Sense of communality and identification with one's social roles Social contact frequency • Living alone • Living with others Social isolation 1. Lack of social contact, communication, participation in social activities, or confidant
2. Functional	Functions provided or perceived to be available by social relationships	Received support 2. Self-reported receipt of emotional, informational, tangible, or belonging support. Perceptions of social support 3. Perception of availability of emotional, informational, tangible, or belonging support if needed. Perceptions of loneliness 4. Feelings of isolation, disconnectedness, and not belonging
3. Quality	Perceptions of positive and negative aspects of social relationships	Marital quality 5. Subjective ratings of satisfaction, adjustment, cohesion in couples Relationship strain 6. Subjective ratings of conflict, distress, or ambivalence
4. Multi-Dimensional	Complex Measures of Social Integration	A single measure that assess the multiple components of social integration such as marital status, network size, and network participation. Multiple measures obtained that assess more than one of the above conceptualizations.

c) The Social-Ecological Model

Every sector, individual, community, and organization has a role to play in fostering social well-being. The social-ecological model demonstrates that social wellbeing is centred around the individual and the context around them, including interpersonal relationships, institutions, communities, and policies at play. The model showcases how an individual's health is shaped by the many influences of society, which comprise the levels around the individual, as showcased in Figure 1 (Killam & Richards, 2022; Killam, 2024).

Figure 3: The Social-Ecological Model



The different levels of the model provide opportunities for public health and social health interventions. For instance, policy can enable or inhibit an individual's ability to connect and form relationships through downstream consequences. Generous parental leave policies, as one example, have the propensity to support increased paternal bonding and nurturing of newly born children, and offer parents the ability to spend quality time with friends and family during this leave to strengthen relationships and optimize their role as caregivers. Having parental leave policies in place for parents not only leads to better outcomes for the baby but, also, for the extended social circle, in terms of physical, mental, and social health (Killam, 2024). Ultimately, this model allows for researchers and statisticians to measure the different levels of relationships and evaluate outcomes, which can then influence policy changes to increase social health and connection in society.

d) Kasley Killam's Social Health Model

Kasley Killam defines social health as the aspect of overall health and well-being that comes from connection" (Killam, 2024, p. 16). Killam models social health as being a third pillar of people's overall health, interconnected with the physical health and mental health pillars. As a result, if one pillar is in a deficit, the other pillars become compromised, leading to poor health outcomes. By contrast, if one pillar is strengthened, it can have strengthening effects on the other pillars. As a concrete example, when a person regularly engages in physical activity, their physiological health improves and so too does their mental health, due to the release of endorphins that occurs during exercise. Based on experiencing improved physical and mental health, a person become better positioned to engage socially as a result of having a better mood, and increased energy. As another example, if a person nourishes their mind and body but neglects their social health and relationships, then a person's overall health falls into jeopardy (Killam, 2024). Killam's research and model serves to emphasize the importance of social health and relationships and how vital a role they play in promoting people's longevity, health, and overall wellbeing.

Figure 4: Kasley Killam's Social Health Model

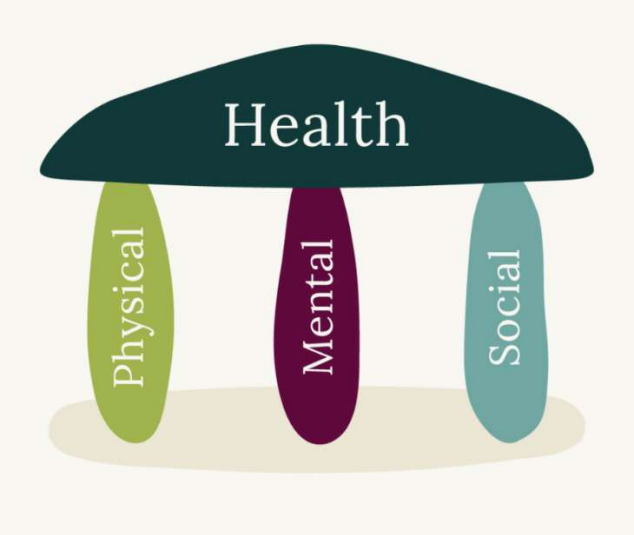


Image source: Killam, K. (2024). The Social Health Toolkit | a gathering place for social health resources — Kasley Killam, MPH | Social Health & Connection expert. https://www.kasleykillam.com/social-health-toolkit

e) Social Isolation and Loneliness – World Health Organization (WHO) Commission on Social Connection

Individuals across the globe are impacted by social isolation and loneliness, with an estimated 25% of older adults experiencing social isolation, and 5-15% of adolescents experiencing loneliness (WHO Commission on Social Connection, 2023). In the same way that society focuses on physical and mental health, key attention must be brought to social health as it, too, impacts health outcomes across the lifespan. Those who experience social isolation and loneliness are not only at risk of premature mortality but, also, face increased risks of experiencing anxiety, depression, dementia, cardiovascular disease, strokes, and committing suicide (WHO Commission on Social Connection, 2023; Killam, 2024). The outcomes of experiencing social isolation and loneliness are not solely contained to an individual; they have deleterious effects on societies and communities at large. To foster a society that is safe, prosperous, and effectively governed, social connectedness must be prioritized in every aspect of society, including in neighborhoods, schools, workplaces, cities, the healthcare system, government, and technology (WHO Commission on Social Connection, 2023; Killam & Richards, 2022).

As part of the UN Decade of Healthy Ageing work, in collaboration with the Bruyère Research Institute, the World Health Organization developed a gap map showcasing evidence-based in-person interventions for reducing social isolation and loneliness. This map focuses on in-person interventions, delivered face-to-face, intended to reduce social isolation and/or loneliness in any age group (ex. children, young adults, older adults) (WHO). A total of 513 articles were included in this evidence and gap map whereby 421 were primary studies and 92 were reviews (WHO). The map includes health and psychosocial outcomes (i.e., loneliness, social isolation, social connection, quality of life/wellbeing, anxiety/depression, self-efficacy or self-esteem, adverse effects, and health services use), indicators of social connections (i.e., social support, social engagement, social cohesion, and social capital), cost and cost effectiveness outcomes (i.e., cost-effectiveness, healthcare/social care utilization costs, cost per participant), and process indicators or implementation outcomes (acceptance, adherence, feasibility, increased awareness of community services, and barriers). Interventions evaluated included those that fall into self-delivery, interpersonal delivery, community-based delivery, societal-level delivery, and multicomponent/complex delivery.

f) Relational Wellbeing

Relational wellbeing (RWB) is an approach to understanding wellbeing that is rooted in the work of Susan White and Shreya Jha, founders of the Relational Wellbeing Collaborative. Drawing from their 20 years of research in the Global South, they argue that we need to shift the focus from thinking about wellbeing as an inner state of individuals to thinking of it as having multiple interwoven dimensions, where relationships play a central role.

RWB is an integrative approach to wellbeing with three interlinked dimensions: material (people having enough of what they need), relational (people being connected in ways that are enabling and fair), and subjective (how people feel about their lives and future). White and Jha are careful to emphasize that while these dimensions are analytically distinguishable, they are interwoven; they are not standalone entities, nor are they necessarily harmonious.

In the RWB approach, individuals are *relational subjects* whose connections and interactions with others and with their social contexts shape their wellbeing. The significance of seeing individuals as relational subjects is that it generates an imperative to study relationships to understand wellbeing: "…if we want to understand what promotes—or undermines—wellbeing, we need to move our focus from the individual to these relationships"; "…we also recognise that these relationships are living things; they need to be tended to and nurtured; and they can be damaged, severed, or simply wither away. Navigating the relationships which sustain wellbeing involves considerable skill, both at the personal and the collective level." (White and Jha, 2023)

In RWB, relationships are also a mechanism for people to address a wide variety of needs. They function for material and subjective wellbeing. Where resource distribution is unequal and state welfare provision is limited, relationships can help to satisfy material needs (White and Jha, 2023). This meeting of needs is not only material but also subjective — the need to feel connected and good about life.

RWB also points to the importance of understanding how these dimensions are influenced by many other intertwined, underlying drivers of wellbeing. These include personal factors such as personality and personal history; societal factors such as economies, inequalities, social norms and culture; and environmental factors such as space, place, built environments, climate, and ecological sustainability. The underlying drivers further reinforce the connections between relationships and the other building blocks of social statistics.

g) Social Capital

Another approach to understanding relationships and their implications comes from work pertaining to the concept and theories of social capital, which can be understood from both individual and collective perspectives.

Robert Putnam is well-known for his pivotal work on social capital dating back several decades. Putnam (2001) refers to social capital as the value stemming from social networks and their associated norms of reciprocity. Many others have worked and continue to work in this space. The basic idea of social capital, according to Woolcock (2001), is that one's social networks – such as family, friends and associates – are an asset that have value for their own sake and that can be leveraged for various means such as assistance during a crisis and/or for material gain.

Social capital is also a multifaceted concept, a full exploration of which is beyond the scope of this paper. That said, Woolcock (2001) points to its multiple forms including kinship and intracommunity ties (bonding social capital), connections across spatial and demographic divides (bridging social capital), and also ties across power differentials (linking social capital). Social networks exist and are shaped by political and economic contexts; the presence or absence of social networks can be positive and/or negative, that is, both a problem and a solution. Social capital can be a liability where, for example, a desire for acceptance leads to harmful acts by individuals and where institutional contexts lead to exclusion or discrimination (Woolcock, 2001, 2005). One's immediate social networks shape one's identity, expectations, and self-worth and social networks influence one's options and opportunities (Woolcock, 2005). The ability of communities to address issues, such as poverty and vulnerability, can be impacted by the extent to which social networks and civic associations exist within (Woolcock, 2001). For example, Woolcock (2001) sees social networks as a defining

feature of poverty; that is, poverty can result where one is not a member of or is excluded from certain social networks and institutions that offer employment and housing opportunities.

Social capital also has implications from a society and economy-wide level; for example, trust in others and confidence in institutions are quality measures included by the OECD in measuring social capital, one of the four "capitals" (alongside financial, natural and produced capital) used to assess the long-term foundations of well-being and ensure sustainability. These measures, for example, influence the stability of an economy and its political institutions with social as well as economic implications.

h) Migration, Displacement and Disaster Risk, Resilience

Understanding the role social connections play in coping with, resilience to and recovery from disaster situations, including forced displacement due to violence, natural disasters, and man-made catastrophes, is essential.

In situations of escalating violence, social connectedness can be critical to refugee survival. Stites, Humphrey and Krystalli (2021) look at the role social connectedness plays in refugee survival during flight and displacement from South Sudan to Uganda. Based on qualitative narratives gathered from two refugee settlements in the West Nile sub-region of Uganda in 2018 and 2019 they show how connectedness provides both non-material (such as information and emotional support) and material support (such as sharing of resources with kin and acquaintances and food with neighbours). Social networks served as pathways for information flow about safety and protection. Exclusion from these pathways could result in loss of life. Stites, Humphrey and Krystalli (2021) point out how refugees created new social connections with people with whom they fled and formed trusted relationships as a source of shared support. These relationships formed among strangers from different locations, clans, or sub-clans. While proximity and shared experiences were central features of social connectedness among refugees, social connections were shaped by gender, ethnicity and language.

Wilkin, Biggs and Tatem (2019) establish that while social networks are widely recognized as essential sources of support during and after disasters a lack of common definitions and measurement approaches has meant that quantifying the role of social supports for disaster resilience has been problematic. To address this gap, they provide a synthesis of 11 empirical case studies of disaster and community resilience within the Global South and conclude that similar approaches to social network analysis and connectivity measurement are emerging and can be leveraged for future research. The reviewed studies measure the level of help and support within a community by assessing the structure and characteristics of their social networks and their overall connectivity. The studies quantify, using a structural network-based approach, how the presence, strength and effectiveness of social networks has a direct impact on communities' resilience to disaster. For example, studies indicated that within the Global South communities individual, household or community social networks are seen as the first line of response to disaster, and the strength and effectiveness of these networks impacts their response capacity (Wilkin, Biggs and Tatem, 2019). The networks within communities mobilized and provided support, resources and information while leadership within communities critical to encouraging collective action. In addition, the case studies pointed to different types of networks that exist (bonding, bridging, and linking) and how these matter for response to disaster shocks. A strong bonding network within a community enables internal response but strong bridging to other communities and linking to institutional resources enables access to help and resources beyond the community. By mapping the community's internal and external networks, a clearer picture of resilience capabilities emerged (Wilkin, Biggs and Tatem, 2019).

i) Social Network Analysis

The phrase 'social network' is originally attributed to Australian sociologist John A. Barnes in 1954, based on field work in Norway to describe social structures within which social actors (such as individuals or organizations) interact (Mitchell, 1974). His analysis systematically described patterns of ties based on bonded groups (e.g., families, kinship tribes) and social categories (e.g., gender, ethnicity). Barnes drew on prior work on 'sociometry' as a quantitative method for measuring social relationships by Jacob Moreno and Helen Jennings in the 1930s, who directly addressed the issue of developing statistical methods for the new purpose of dealing with social configurations (aggregates of individuals). The phrase 'social network' pre-

dates the internet, though it has more recently become synonymous with internet-based and typically commercial platforms for social exchange.

Contemporary social network analysis is an important area of sociology which offers a perspective and set of methods for analysing the structure and relationships between these actors: network dynamics. A foundational assumption when social network analysis is undertaken is that the properties and structure of the networks themselves have significant implications on the outcome of interest. Where typical epidemiology study designs focus, for example, on individual characteristics/behaviours and their influence on health outcomes, social network analysis collects and analyses relational data such as contacts, ties and connections as a system of agents (Mailman School of Public Health, n.d.). Networks can be characterized by nodes (individual actors, people, or other elements within the network) and the ties (relationships or interactions) that connect them; often represented visually. Data can be collected and stored about attributes associated with the ties themselves, such as whether the relationship is weak or strong, or the network itself is closed or open. Social network analysis is a key technique in modern sociology, drawing on mathematical foundations of graph theory, but has older roots in sociology; for example early German sociologist Georg Simmel (1858-1918) introduced the dynamics of dyads, triads and webs of group affiliations.

The theoretical constructs underlying social network analysis are relevant to how social networks between individuals and other social actors (e.g., families, households, institutions) are understood and thus useful from a conceptual standpoint, for example to understand the extent of social connectedness. Social network analysis also offers potential applications for structuring data about the attributes of relationships, as relevant for specific analytical projects. Tools from big data that store information not only about nodes, but also about ties and the characteristics of those ties may offer potential from a measurement standpoint for NSOs to explore in terms of collecting and analysing information about relationships and social connectedness. NSOs do often have information, for example, about individuals that reside together in a household.

Comprehensive collection and storage of this type of data about broader relationships and relationship quality at the population level is not recommended for NSOs; there is no obvious policy rationale, and this would raise concerns not only about feasibility but also desirability in terms of social license. However, social network analysis is helpful firstly from a conceptual standpoint to demonstrate how the individual people that make up a nation's demography relate to one another to build a society and its institutions. It can also be a statistical tool for specific enquiries. Examples of current applications for this type of data collection, storage, visualization and analysis have included disease transmission and the spread of misinformation.

In some cases, NSOs may also acquire data for social network analysis from social network companies. The authors note several challenges to undertaking social network analysis including temporal and spatial aspects yet note the potential that comes with new dynamic network datasets, such as mobile phone metadata and social network datasets, that could be used to map community connectivity and social networks. The potential of big data sets and the social license, legislative frameworks needed for their responsible use are of importance to the study of social connectedness.

Annex D.3: Other initiatives in Canada related with measuring relationships

a) Canadian Alliance for Social Connection and Health

In Canada, the CCS (CASCH) was established with the mission of preventing social isolation and loneliness through the encouragement of inter-institutional collaboration, improvement of research, and knowledge mobilization to direct practice and policy (Canadian Alliance for Social Connection and Health). CASCH strives to serve as a leader in reducing social isolation and loneliness in Canada by coordinating community and academic initiatives to enhance social health. The Alliance has three core pillars through which their work operates that include:

1. **Convening, Collaborating, and Capacity Building** - Uniting diverse collaborators and partners to foster cooperative initiatives and enhance collective capabilities in addressing social isolation and loneliness.
2. **Research and Evaluation**: Conducting rigorous research and thorough evaluations to understand and effectively address the complexities of social isolation and loneliness.
3. **Knowledge Mobilization for Policy and Practice**: Translating research insights into actionable strategies, influencing policy, and informing best practices to combat social isolation and loneliness.

With these core pillars inherent in their work, CASCH disseminates publications on the topic of social health based on evidence from literature reviews and data analysis. For instance, one of their releases includes an evidence brief on social health, which highlights the evidence from existing literature on the different dimensions of the concept, including social isolation, loneliness, social support, relationship quality, social capital, and social cohesion, as a few examples, and provides an analysis on results from the Canadian Social Connection Survey.

b) GenWell – Human Connection Movement

GenWell's mission is to foster social connections across Canada, recognizing the vital importance of social connections and their impacts on mental, physical, and social wellbeing. GenWell defines social health as being an aspect of overall well-being that is derived from relationships and connection (GenWell). Social health includes deep meaningful connections with friends and family, casual interactions that people have with their classmates, coworkers, and neighbours, and the daily connections people have with strangers (GenWell). These aspects of connection provide people with a sense of belonging, feelings of inclusion and support, and being seen, valued and understood.

The Canadian Social Connection Survey is developed in partnership with the GenWell Project, a Canadian non-profit, researchers at Simon Fraser University, and The Institute for Social Connection. The survey aims to investigate the mechanisms through which social connection affects wellbeing, the dose-response relationship between loneliness and poor health, and the strategies people can employ to enhance their social and general wellbeing.

Key measures in the survey include:

1. Self-rated physical health
2. Self-rated mental health
3. Household size
4. Social time with friends in the past 7 days
5. Social time with family in the past 7 days
6. Number of friends the respondent connected with in the past 7 days
7. Number of family members the respondent connected with in the past 7 days
8. Zimet family support score
9. Simet Significant other support score
10. De Jong social loneliness score

Analysis of the survey revealed several key findings including the importance of having high quality relationships in the context of a person's perceived social support and feelings of loneliness, and the independent effects of having a higher number of social interactions based on assessing the number of friends who visited in the past seven days indicator (Raufi, Murtov, Refol, Frost & Card, 2023). Further insights revealed the importance of social support received by family as a key predictor of an individual's physical and mental health (Raufi et al., 2023). Through the comparison of social loneliness and emotional loneliness, the effect of emotional loneliness was found to have a greater impact on both self-rated health and self-rated mental health compared to the effect of social loneliness (Raufi et al., 2023). This analysis, as one example of their work, provides notable contributions to the social health and connection research landscape and reveals opportunities for interventions in the context of policy and decision making.

Figure 5: The components of social health according to GenWell

GenWell is committed to promoting discussions on social health and engaging Canadians in the conversation to foster improved mental, physical, and social wellbeing. In view of the fact that social health cannot be achieved alone, unlike mental and physical well-being, GenWell focuses on both population-level activation and individual education and empowerment. One of the key promising strategies that serves their mission includes collaborating with CASCH on the Canadian Social Connection Survey to provide better insights on Canadian social connections and social health. As another example of their measurement work, GenWell administers their own Social Health Quiz, which is a 12-question survey that enables respondents to see where their social health sits compared to other Canadians, based on data from the Canadian Social Connection Survey.