



## Population Registers: A Key Resource for Producing Vital Statistics

Technological advances have increased the potential uses of population registers for producing statistics. At the same time, greater demand for timely and disaggregated data amplifies interest in population registers as a source of statistical data. This brief will examine the how population registers can be used to produce vital statistics, looking at the historical and current context, the role of population registers within the National Statistical System, integration with other data sources, linkages with the Civil Registration and Vital Statistics system, and the production of vital statistics. Case studies and recommendations for improvement are included within the brief.

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### 1. Introduction

Population registers are not a recent invention. However, technological advances in the use of population registers for the purposes of administration and service delivery have increased interest in developing existing ones further or establishing new ones.<sup>1</sup> At the same time, increased demand for timely and disaggregated data (such as, for monitoring the 2030 Agenda for Sustainable Development) has amplified interest in population registers as a source of statistical data, especially up to date and granular population estimates.

The COVID-19 pandemic has put a spotlight on the need to broaden statistical methods and sources – including the use of administrative data such as registers – for statistical production. For example, it is impossible to calculate accurate and timely mortality rates (a key indicator of the impact of COVID-19) where the exposed population is not correctly known. Improved technology provides the impetus for further exploiting registers although caution must be exercised to mitigate the potential risks that such advances (especially through record linkage) pose to the security of personal data through unauthorised access to data or,

more worryingly, improper use of the data. This paper explores the role of population registers as a critical source of population data. It also recognises their role in facilitating the realisation of universal legal identity. We recommend that countries consider how to further the use of population registers for statistical purposes, especially demographic statistics. This would require potential revisions of legislation to facilitate the establishment of frameworks for secure data sharing and quality assurance and including a mechanism for oversight and to redress problems. The important coordinating role of the National Statistics Office is implicit throughout, both for those countries with established population registers and those planning to establish one.

This paper forms the first in a three-part series of Stats Briefs on the potential statistical uses of population registers. The focus of this Stats Brief is on the production of population statistics from population registers and will be followed by one on the use of population registers for censuses and another on using population registers for sampling frames.

<sup>1</sup> Poulain, M. & Herm, A. (2013). Central Population Registers as a Source of Demographic Statistics in Europe. *Population*, vol. 68(2), 183-212. doi:10.3917/popu.1302.0215.

## 2. Historical context

Human societies have invested in population registers throughout history. While they are currently more commonly associated with European countries, their origins lie in Asia with the first known registers operating in China, Korea and Japan since the early seventh century. The earliest form of a population register, although more a list of people rather than a population register in the modern sense, comes from ancient China during the second century BCE and was a means to determine the obligation to pay taxes and deliver *corvée* labour, to recruit troops and in some instances to select candidates for state offices.<sup>2</sup> Japan adopted a nationwide administrative household-based registration (known as “*koseki*”) in the period 645-649<sup>3</sup> and later, in the period 1600-1868. In Korea, the “*hojuje*”, a family registration system modelled on Japanese civil law,<sup>4</sup> was introduced in 1898; since 2008 it has been replaced by a new family registration system taking into account gender equality and privacy provisions lacking in the previous system.

## 3. Definition and purpose

According to the United Nations, a population register refers to “an individualised data system, that is, a mechanism of continuous recording, and/or of coordinated linkage, of selected information pertaining to each member of the resident population of a country in such a way to provide the possibility of determining up-to-date information concerning the size and characteristics of that population at selected time intervals”.<sup>5</sup> The organisation and operation of such a system must have a legal basis, which among others, includes that registration should be compulsory.<sup>6</sup>

Population registers are based on an inventory of the residents of an area, augmented continuously by current information on their vital events, sex, citizenship, change of name, and change of residence. These registers are the result of linking people’s

records maintained across different databases, in which notification of important changes in civil status is automatically made to a central file on a continuous basis, throughout the life time of an individual.<sup>7</sup> The linkage may be extended to other registers with additional information, for example, on educational attainment, activity status and occupation.

Although population registers are maintained primarily for administrative purposes, evolving and increasing data demands coupled with continuous technological developments, have broadened the ways in which they can be used for statistical purposes. This paper intends to look into the statistical uses of the population register whereby population registers provide a critical source of information of the size of a population and its socio-demographic structure at a point in time, as well as population change over time and demographic flows.

## 4. Population registers and the National Statistical System (NSS)

There are two main potential uses of a population register within an NSS. One is as a key administrative data source to replace the traditional census, either as a basis for a register-based census or for developing sampling frames and/or weights for household surveys.

The other is as a data source to augment the continuous production of vital statistics, as well as statistics on migration, amongst other topics. In this brief, we will focus on the latter purpose with the other statistical uses of population registers to be discussed in more detail in following *Stats Briefs*.

Since population registers are usually set up for supporting government processes and services and not statistical purposes, a transformation process, including substantial checking, cleaning and editing of the data, is necessary in order to create a reliable data source. As a result, compromises may need to be made to enable full use of the data source. The advantages of using

<sup>2</sup> <http://www.chinaknowledge.de/History/Terms/huji.html>

<sup>3</sup> Ronald, R & Alexy, A. (2017). *Home and Family in Japan: Continuity and Transformation*. (Routledge)

<sup>4</sup> <https://www.international-divorce.com/korea-s-revised-civil-code-concerning-family-system>

<sup>5</sup> [https://unstats.un.org/unsd/demographic-social/sconcerns/population\\_registers/#overview](https://unstats.un.org/unsd/demographic-social/sconcerns/population_registers/#overview)

<sup>6</sup> Poulain, M. & Herm, A. (2013). Central Population Registers as a Source of Demographic Statistics in Europe. *Population*, vol. 68(2), 183-212. doi:10.3917/popu.1302.0215.

<sup>7</sup> [https://unstats.un.org/unsd/demographic-social/sconcerns/population\\_registers/#overview](https://unstats.un.org/unsd/demographic-social/sconcerns/population_registers/#overview)

population registers as an extant data source are the potential for cost saving, increased timeliness of data and improved coverage and granularity of population

stocks and flows, all of which usually outweigh the required inputs and compromises (Table 1).

Table 1: Advantages and disadvantages of register-based population statistics<sup>89</sup>

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>• Lower respondent burden</li> <li>• Lower direct costs of statistical production</li> <li>• More detailed statistics as there is no sample constraints</li> <li>• More frequent and more timely release of data</li> <li>• Better quality in many instances</li> <li>• Ability to include topics that are available in registers that are not well suited to a conventional census (e.g. income)</li> <li>• Provides potential for longitudinal analysis by linking various events in one person's life</li> </ul>	<ul style="list-style-type: none"> <li>• Rely on the information collected in the administrative registers</li> <li>• Dependent on the degree to which the register is kept up to date. Dependent on the administrative system's definitions, coverage and reference time (but could be more consistent than definitions for self-reported characteristics)</li> <li>• Statistical agencies may not be involved in or even informed of changes in the administrative systems to meet administrative needs</li> <li>• Increased data handling and risk</li> <li>• Vulnerable to changes in administrative systems</li> </ul>

The Nordic experience with generating statistics from population registers highlights several necessary preconditions.<sup>10</sup> First, there needs to be a robust legal base which needs to cover many different aspects underpinning the effective use of population registers to generate statistics. The National Statistical Office, or equivalent body, needs the legal right to access the population register and to link with other data sources for statistical purposes. Clearly, this also entails protecting privacy and confidentiality as described above. Beyond putting in place a robust legislation, it is essential that the NSO cultivates quality relationships with the custodians or “owners” of existing registers and facilitates ongoing dialogue and support to maintain or improve the quality of the registers. Well-functioning National Strategies for the Development of Statistics (NSDS) are a critical resource in this regard. Second, public approval is required.

Population registers can give the impression, sometimes justifiably so, of a “Big Brother” state, especially when individual data is linked. Thus, it is

important to communicate the advantages of using population registers for statistical purposes and ensure trust in the system. Third, to fully exploit population registers, personal Unique Identifier Numbers (UINs) are required.

Finally, the administrative functions should be clear and have public trust and confidence to ensure that data is frequently and reliably updated and that the entire population is fully covered.

Singapore intentionally modelled its population register-based statistics on the Nordic system.<sup>11</sup> It ensured the NSO possessed the essential conditions outlined above to facilitate the extensive use of the register in statistics production. Namely, Singapore has an established legal framework to acquire administrative data for statistics use, a personal UIN and registered address for every resident, and a comprehensive and reliable population register developed for administrative needs.

<sup>8</sup> <https://www.singstat.gov.sg/-/media/files/publications/population/ssnmar17-pg1-7.pdf>

<sup>9</sup> Verhoef, Rolf, and Dirk J. Van de Kaa. “Population Registers and Population Statistics.” *Population Index*, vol. 53, no. 4, 1987, pp. 633–642. JSTOR, [www.jstor.org/stable/3643792](http://www.jstor.org/stable/3643792). Accessed 13 Sept. 2020.

<sup>10</sup> [http://www.unece.org/fileadmin/DAM/stats/publications/Register\\_based\\_statistics\\_in\\_Nordic\\_countries.pdf](http://www.unece.org/fileadmin/DAM/stats/publications/Register_based_statistics_in_Nordic_countries.pdf)

<sup>11</sup> <https://www.singstat.gov.sg/-/media/files/publications/population/ssnmar17-pg1-7.pdf>

## 5. Integration with other sources and the role of unique identifiers

Building and updating a population register and enriching the statistics that can be produced from it, requires integrating different data sources. Data integration (pulling together data from different available data sources) promises a cost-effective means to meeting more data and statistical demands, and, producing data and statistics at a higher frequency and at further disaggregated levels. However, key considerations include the legislative and policy framework, social license, privacy and confidentiality, access to data and metadata, and interoperability.

Interoperability implies consistency in concepts, definitions, classifications, data formats and reference periods. Additionally, it needs to be possible to split the data by different administrative and statistical units through a higher level of granularity where they are not consistent. Precise geolocation included in the data can greatly facilitate this. Before combining different data sources for a population register, inconsistencies should be identified and resolved as far as possible. This process can be difficult and time consuming and must include an array of stakeholders. All existing inconsistencies and their impact, together with applied techniques to resolve them, should be well documented.

Indeed, any reliance on administrative sources, including population registers, implies that concepts, definitions and classifications for any variable may not necessarily align with those usually preferred for statistical purposes. Hence, to produce meaningful statistics, statisticians should work with the owners of the administrative sources to understand the data source and recommend any necessary adjustments.

The identification and resolution of inconsistencies benefits from the availability of comprehensive metadata and close collaboration with administrative authorities and official statisticians. Strong and sustainable connections among involved parties enable

better understanding of the quality of data sources and better identification of inconsistencies and their impact. Also, it offers the opportunity to influence administrative procedures in support of integration, which can include developing, implementing and applying common concepts, definitions, and classifications, as appropriate. In order to fully exploit population registers, unique personal identifiers should be assigned at birth. Approximately 70 countries assign a UIN at some stage in the life of a citizen or resident.<sup>12</sup> In the past, these numbers often reflected characteristics of the individual such as sex, birth date and possibly geographical areas (of the registration point or the place of birth). While this made sense in the past, where individuals would have to remember these numbers and there were fewer concerns about privacy and identify fraud, these days, personal UINs should ideally be random numbers assigned centrally, and which can also be shorter than those with identifying characteristics.

More recently, countries have been moving away from using a single number across all systems; current best practice is to use other means to connect data such as an encrypted number.<sup>13</sup> The future of UINs will likely move towards electronic unique keys, which are different for each application for each individual, which can facilitate more complex separation of information, protecting the individual further.<sup>14</sup> However, despite their importance, International standards on UINs are yet to be developed.

Over time, attitudes towards the right to privacy and confidentiality have greatly changed as the threats to, and awareness of, privacy and potential harm from data breaches have increased. In establishing, updating and using population registers, provisions for protecting confidentiality and assuring privacy of individuals should be considered and reinforced by strong frameworks and supported by functional and robust practice and infrastructure, including the implementation of oversight, redress and correction when things go wrong. These provisions determine who can access the individuals' information, while

<sup>12</sup> World Bank 2018: Integrating Unique Identification Numbers in Civil Registration, available from <http://pubdocs.worldbank.org/en/795091518546134883/27385-Integrating-Unique-Identification-NEW-FINAL-0221.pdf>

<sup>13</sup> <https://unstats.un.org/legal-identity-agenda/documents/UNCT-Guidelines.pdf>

<sup>14</sup> World Bank 2018: Integrating Unique Identification Numbers in Civil Registration, available from <http://pubdocs.worldbank.org/en/795091518546134883/27385-Integrating-Unique-Identification-NEW-FINAL-0221.pdf>

implementing mechanisms for the secure transfer of data among authorised agencies. They can also provide appropriate procedures for the release of data for research purposes as well as provide proactive preparations against breaches of privacy and confidentiality in integrating data from different sources, including a process for response and correction in the event of breaches and, ideally, independent oversight.

### Case Study 1: Statistics from registers in Sweden

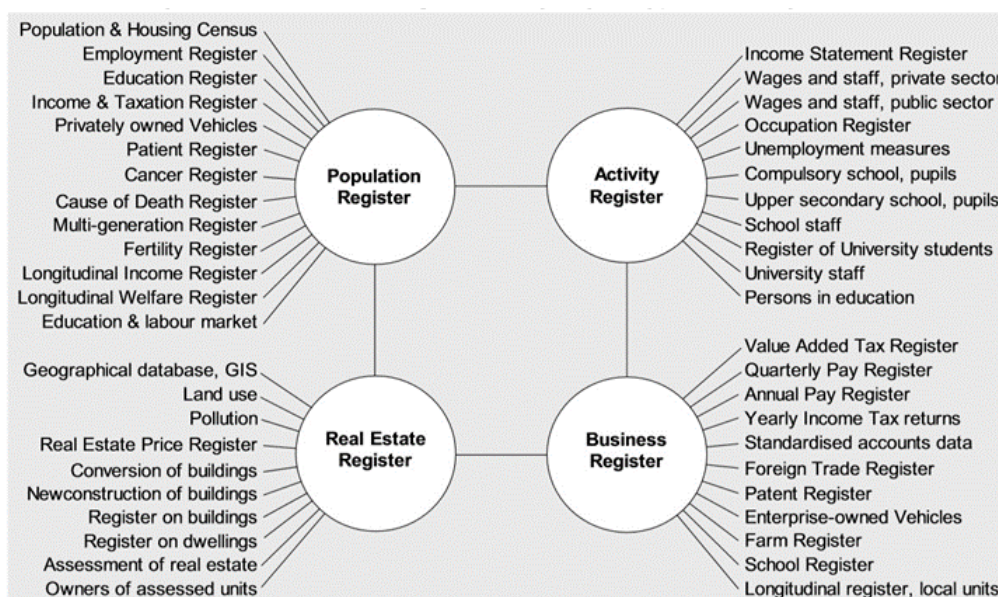
As in many Nordic countries, Sweden maintains population-based registers with personal data and a system of personal UINs that allow researchers to link data from different registers to a specific individual. Registers of interest from a research point of view can be divided into national public authority registers,

quality records in healthcare, biobanks and research-generated data.<sup>15</sup>

The registers are used as a sampling base for traditional surveys, to complement survey data with register information and for pure register statistics, where commonly, information is taken from two or more registers.<sup>16</sup> Since 2001, the policy in Sweden has been to use register-based data for statistics to the greatest extent possible.<sup>17</sup> Additionally, Sweden has benefited from strong trust in the Government which has helped facilitate public support for the necessary data integration and record linkage.

Figure 1 below illustrates Sweden’s experience with integrating other statistical data sources with the population register.

Figure 1: Integration of statistical registers with the population register in Sweden<sup>18</sup>



The use of register data for producing statistics in Sweden is underpinned by the Personal Data Act (1998). The Act lists certain fundamental requirements concerning the processing of personal data. These demands included, *inter alia*, that personal data may

only be processed for specific, explicitly stated and justified purposes, and if the person registered gives his/her consent. Exemptions to this rule include the exercise of official powers, or the fulfilment of a legal obligation by the controller of personal data. The

<sup>15</sup> Registerforskning.se: registers in Sweden accessed 20 August 2020: <https://www.registerforskning.se/en/registers-in-sweden/>

<sup>16</sup> Economic Commission for Europe 1999 Registers in Official Statistics: A Swedish Perspective, Working Paper presented to the Conference of European Statisticians Geneva 1-3 March 1999

<sup>17</sup> Statistiska centralbyrån 2020 Kvalitet för den officiella statistiken -en handbok version 2:2 available from [https://www.scb.se/contentassets/4e625b9324b54e7fa5c4db77cedb7ebc/ov9999\\_2020a01\\_br\\_x99br2001.pdf](https://www.scb.se/contentassets/4e625b9324b54e7fa5c4db77cedb7ebc/ov9999_2020a01_br_x99br2001.pdf)

<sup>18</sup> “Register-based Statistics: Statistical Methods for Administrative Data” by Anders and Brit Wallgren.

Act has been amended to be aligned with the European [General Data Protection Regulation](#).<sup>19</sup>

A Data Inspection Board is responsible for protecting individuals' privacy so that data is not misused.<sup>20</sup> The Civil Registration Act describes which registries must be kept, the purpose of the registries, what they may contain and how users can search for information within their systems. The Act is supplemented by an ordinance on population registries, stating, among other things, when information should be transferred between the different registries. It regulates the population registry together with the Population Registration Act.<sup>21</sup>

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## 6. Population registers and civil registration and vital statistics systems (CRVS)

The foundation of a universal population register is based upon a civil register that maintains records of vital events such as live births, deaths, marriages, and divorces, and which can be used to derive statistics on demographic flows. While a civil register on its own is not a population register, it is a fundamental requirement for a functioning population register. It means that at a minimum, every birth and death must be registered. If vital events are not registered and the records are not reflected in the population register, then the ability to use population registers to generate statistics on either population stocks or flows is limited. Entries through births and exits through deaths are fundamental movements that need to be recorded; completeness of registration is key to the production of good quality statistics. Though not considered a vital event, migration is also a critical data element in a population register whose inclusion enables the size of population to be accurately derived at any given point in time and for given geographical units.

As shown in [Figure 2](#), the civil register and the population register need to be interoperable with an established process for continuously sharing data. A well-functioning population register can be characterised by the continuous, universal and timely updating of vital event information provided by a civil register. As described earlier, there should be a secure linkage of such information with data from other administrative registers such as immigration, social security, education and employment through a personal UIN which should ideally be assigned when a birth is registered. The linkages between a population register and the civil register should be explicitly backed by a robust legislative, policy and institutional framework.

<sup>19</sup> European Union 2019: Digital Government Factsheet 2019: Sweden, accessed from [https://data.europa.eu/euodp/data/storage/f/2019-09-27T133936/SC64\\_D05.03\\_Digital\\_Government\\_Factsheets\\_Sweden\\_2019\\_vFINAL.html](https://data.europa.eu/euodp/data/storage/f/2019-09-27T133936/SC64_D05.03_Digital_Government_Factsheets_Sweden_2019_vFINAL.html) on 7 September 2020

<sup>20</sup> Datainspektionen 2020: Om Oss, accessed from <https://www.datainspektionen.se/om-oss/> on 7 September 2020.

<sup>21</sup> Ibid

<sup>22</sup> European Union 2019: Digital Government Factsheet 2019: Sweden, accessed from [https://data.europa.eu/euodp/data/storage/f/2019-09-27T133936/SC64\\_D05.03\\_Digital\\_Government\\_Factsheets\\_Sweden\\_2019\\_vFINAL.html](https://data.europa.eu/euodp/data/storage/f/2019-09-27T133936/SC64_D05.03_Digital_Government_Factsheets_Sweden_2019_vFINAL.html) on 7 September 2020

The United Nations Legal Identity Agenda, launched in May 2019, consists of a holistic approach to civil registration, vital statistics and identity management and represents a model that can be used by all member States; the population register is a major component in that model where it exists. The establishment, operation and maintenance of a population register based on an unambiguous legal mandate provides a necessary mechanism for several administrative and statistical purposes. In practice, a population register cannot be described as such without being linked with the registration of vital events, which constitutes information fundamental to its updating, together with changes of address. In this respect, population registers are a kind of continuous census, encompassing the structure of the population at any given point in time, with modifications occurring within it on a moment-by-moment basis.<sup>23</sup>

The essential premise of population registers and their functioning is that the civil registration system is uniquely positioned to provide reliable data to be entered into the population registers. Specifically, population registers are initially built up from an inventory of information on the inhabitants of a certain area (often census information) and the continuous updating of the facts of births, deaths, adoptions, legitimations, recognitions, marriage, divorce, annulments and judicial separations, change of name or sex, and change of residence. An efficient connection with the civil registration authority is therefore a fundamental element for the proper functioning of the population register.

### Case Study 1: Population register data and the civil registration system of the Islamic Republic of Iran

Civil registration in Iran is well established and dates to 1918. More recently, legislation on assigning a National Identity Number (NIN) to all Iranian nationals was endorsed in 1989 and all administrative authorities were later mandated to streamline NIN in all services provided to individuals. The existence of NIN enables

a flow of data on individuals among the relevant databases. Major vital events are well-registered. In 2019, 98.9 per cent of children in Iran were registered within one year of birth and 96.4 per cent of deaths were registered. Registration data feeds into the national population database, based on which the National Organization for Civil Registration produces vital statistics on births, deaths, marriages and divorces. Most of the registration processes are available online. However, insufficient incentives for individuals to declare a change of address hinders updating usual residence in the population register, which limits the potential to use the population register data for producing population statistics especially on internal migration.

### Case Study 2: Resident registration system of the Republic of Korea

Korea's resident registration system manages individuals' resident registration card based on the Citizen Registration Act legislated in 1962. It includes information such as date of birth, current address and address change. Processes are almost exclusively online. In Korea, the Resident Registration (RR) System is the national identification system and is used to provide a wide range of public services. Data are saved in the RR system with the RR number assigned to each citizen for identification purposes.<sup>24</sup> RR numbers have been central in the digitalisation of government databases, as they eliminate the need for creating new identification systems and enable administrative agencies to access and use existing databases.

Statistics Korea uses the central database to compile and edit data to analyse and produce vital statistics. In addition to civil registrations,

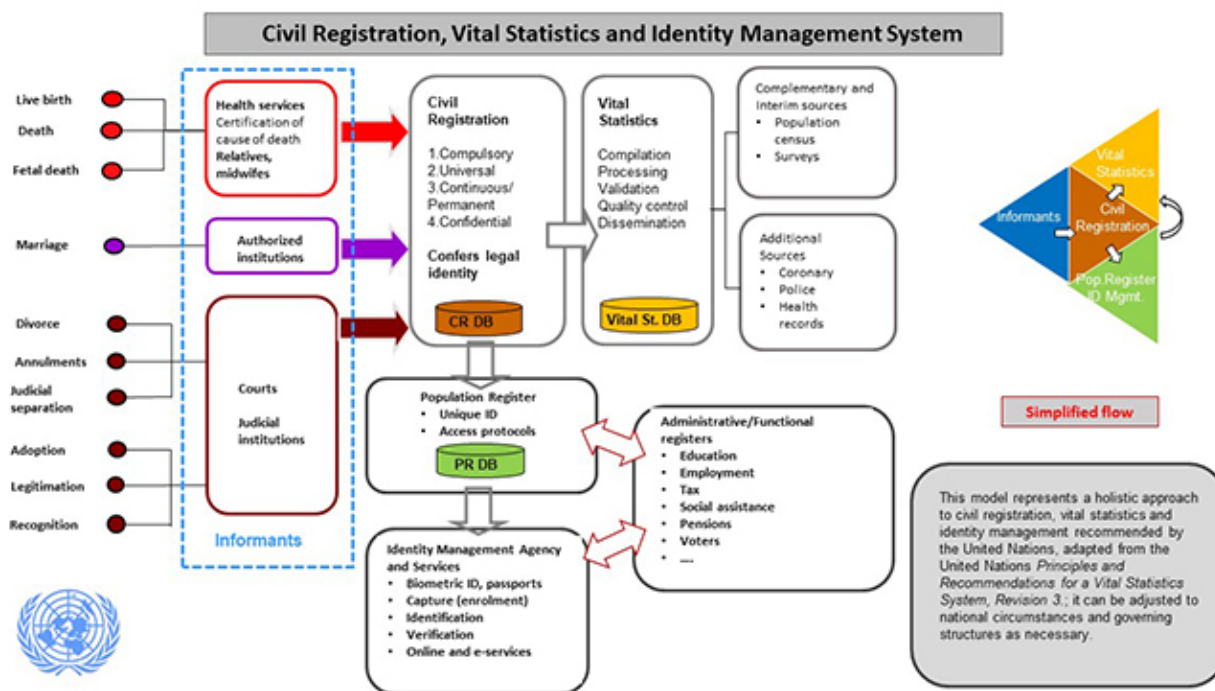
Statistics Korea also incorporates other data such as the death of infants in the hospitals, crematory data and police data from the National Police Agency, as well as data from health institutions to increase the accuracy of vital statistics.<sup>25</sup>

<sup>23</sup> Implementation of the United Nations Legal Identity Agenda: United Nations Country Team Operational Guidelines, United Nations, May 2020, para 92, available at: <https://unstats.un.org/legal-identity-agenda/documents/UNCT-Guidelines.pdf>

<sup>24</sup> Ministry of Strategy and Finance, Korea 2015: The evolution of the Resident Registration System in Korea, accessed from <https://getinthepicture.org/resource/evolution-resident-registration-system-korea-2015> on 20 August 2020

<sup>25</sup> ESCAP 2020: Republic of Korea, accessed from <https://getinthepicture.org/country/republic-korea> on 20 August 2020

Figure 2: Relationship between the population register, civil registration and the vital statistics system<sup>26</sup>



### Case Study 3: The population register, identity management and the CRVS system in Armenia

The Ministry of Justice is responsible for civil registration in Armenia while the police are responsible for identity management and for operating the population register.

The police issue national identity cards, travel documents and driver’s licenses — documents that are officially recognised as identification credentials and proof of identity.

The population register stores identity and other data for all members of the population who have established residency in the territory of Armenia.<sup>27</sup> The National Statistical Committee is the main producer of official statistics in Armenia. This Committee coordinates all activities related to developing, producing and disseminating official statistics through the system of national statistics, except for the Central Bank. To produce vital statistics and population estimates, the Committee relies on civil registration records as well as medical data from the e-health system.<sup>28</sup>

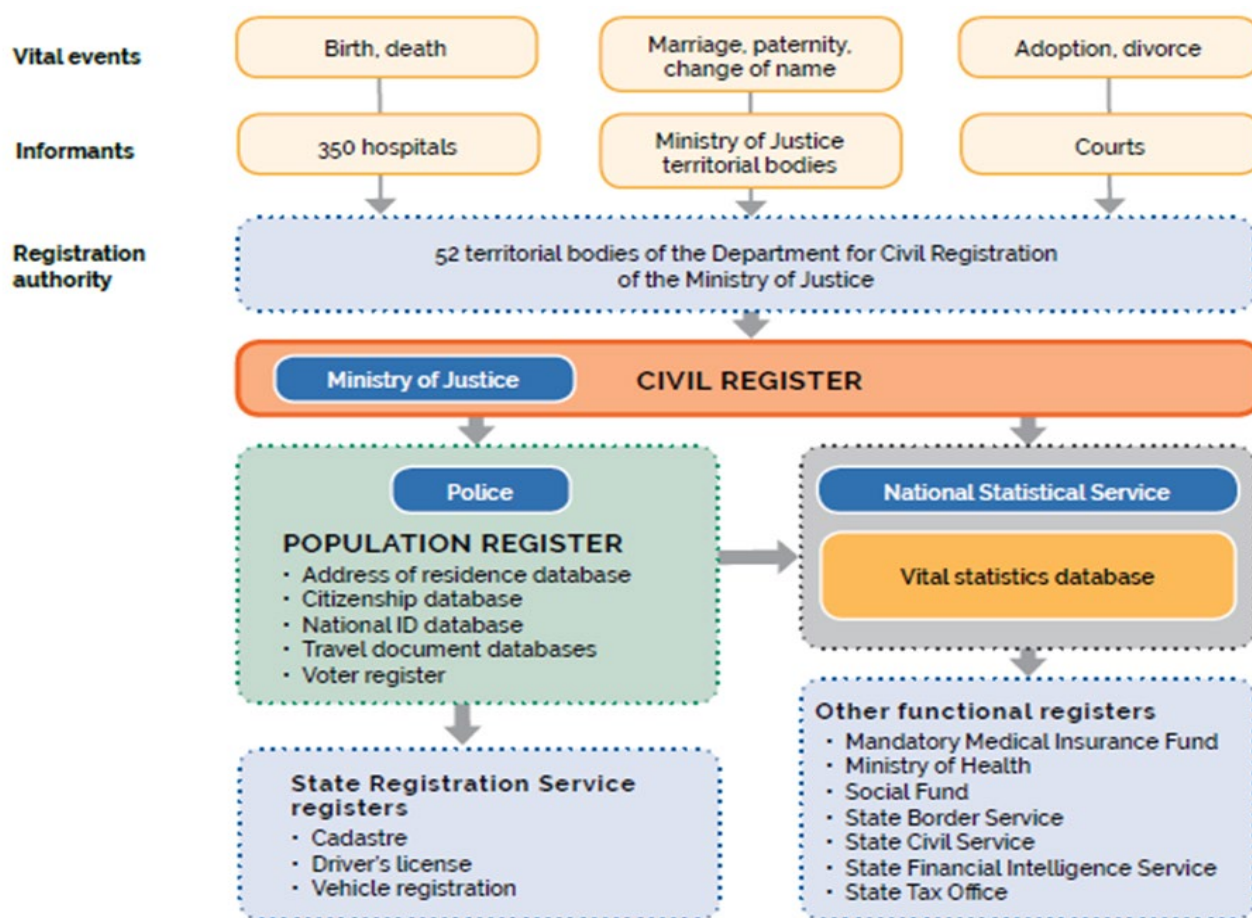
<sup>26</sup> United Nations Legal Identity Agenda (2020) <https://unstats.un.org/legal-identity-agenda/> accessed on 31 July 2020

<sup>27</sup> Centre of Excellence (forthcoming): Snapshot of civil registration and vital statistics systems of Armenia

<sup>28</sup> Ibid



Figure 3: Overview of the civil registration, ID and vital statistics system in Armenia<sup>29</sup>



### 7. Producing vital statistics and demographic indicators from population registers

While the primary purpose of a population register must be administrative, it is also a potentially excellent source of data for generating vital statistics and key demographic indicators. However, this requires some preconditions, and cooperation and collaboration with the NSS (as discussed previously). Further, some population registers need to increase coverage and data quality in order to be a suitable data source. Generally, where population registers are founded on well-functioning civil registration systems, it becomes possible to expand the accuracy, reliability, granularity and scope of the statistics which can be derived from them.

A significant advantage of using population registers to compute vital statistics is the possibility of directly calculating specific demographic rates with potentially no numerator-denominator bias.

For instance, it could be possible to compute specific fertility rates for employed and/or immigrant women, parity progression ratios, life expectancy by educational attainment, indicators on mixed marriages by ethnic group/foreign background, divorce rates by socioeconomic class of the spouses, etc.

This requires full matching between civil registration and population register data, with the civil registration data serving as a fundamental data source for the population register. The same level of detail of information should be contained in both sources, meaning that the certificate of the event (birth, etc.) must contain the same classification of information as

<sup>29</sup> Centre of Excellence on CRVS 2019: Compendium of Good Practices in Linking Civil Registration and Vital Statistics (CRVS) and Identity Management Systems –Case study 1 on Armenia, available from [http://www.data4sdgs.org/sites/default/files/2019-12/CRVS\\_Armenia\\_e\\_WEB.pdf](http://www.data4sdgs.org/sites/default/files/2019-12/CRVS_Armenia_e_WEB.pdf)

that available in the population register. In general, the use of the population register provides a broader opportunity to correctly identify the population segment at risk of an event. The timeliness of the updating of the population register and the accuracy of the information recorded therein are therefore factors critical to the quality of the statistics to be computed.<sup>30</sup>

Information regarding basic demographic characteristics is usually recorded in the population register based on documentary evidence. This includes data on birth (including name, sex, date and place of birth, parentage), marriage, divorce and widowhood (including the identity of the late spouse), citizenship and death. For these variables, the risk of error is low and limited to mistakes in coding or transcription, except in cases of deliberate fraud. Furthermore, as described previously, if the population register is frequently accessed and checked for administrative purposes, errors of this type are likely to be corrected. Information concerning vital events can thus be considered as highly reliable.<sup>31</sup> In contrast, self-reported data mainly concerns changes in place of habitual residence and household composition, which are often less reliable, although lack of regular updates is a challenge for other variables and can impede the use of population registers for statistics on these topics. The instructions for keeping population registers lay down a set of controls, along with penalties for false declarations, which can help ensure higher quality information.<sup>32</sup>

A potential advantage of population registers is the possibility of calculating migration flows. Migration events are generally more complicated to record (and define) than births and deaths. Most countries do not register migration or change of address but maintaining a population register usually requires registering change of address and therefore can provide a rich

source of data. Each individual recorded in the central population register is attached to a specific place of residence.<sup>33</sup> The Nordic countries register internal and international migration on a continuous basis to update population registers and publish migration statistics derived from their register.<sup>34</sup> However, few other countries have been able to generate migration statistics from population registers alone, usually because not enough people update their addresses in the register in a timely manner.<sup>35</sup> There need to be strong incentives for individuals to update their records at every move, which is rarely the case, and it can be assumed that statistics on migration derived from a population register are usually less reliable than those on vital events. A particular problem in most countries with a population register is the tendency of people who leave with the intention of settling abroad to avoid reporting their out-migration to the relevant authorities, or doing so with a delay depending on benefits and incentives for continuing residency. Thus, international migration, especially emigration of non-citizens, is the least reliable of the demographic flows generated from population registers and is often underestimated.<sup>36</sup>

Despite these challenges a population register can still be a useful source of migration data when integrated with other data sources, as is the case in Austria, Hungary, Israel (only for international migration), Italy, Latvia, the Netherlands and Spain, in addition to the Nordic countries.<sup>37</sup> Further, foreign citizens also need to be registered in the population register and not in a separate register, which is done in many countries. Otherwise, the production of statistics will be more complicated and error prone.

Some countries with good administrative records but not a population register may also be able to use these records to generate vital statistics, although this is not a given. Moving towards register-based statistics

<sup>30</sup> <https://unstats.un.org/unsd/demographic/sources/popreg/popregmethods.htm>

<sup>31</sup> Ibid

<sup>32</sup> Ibid

<sup>33</sup> Poulain, M. & Herm, A. (2013). Central Population Registers as a Source of Demographic Statistics in Europe. *Population*, vol. 68(2), 183-212. doi:10.3917/popu.1302.0215.

<sup>34</sup> [http://www.unece.org/fileadmin/DAM/stats/publications/Register\\_based\\_statistics\\_in\\_Nordic\\_countries.pdf](http://www.unece.org/fileadmin/DAM/stats/publications/Register_based_statistics_in_Nordic_countries.pdf)

<sup>35</sup> <https://www.unece.org/fileadmin/DAM/stats/publications/2018/ECECESSTAT20186.pdf>

<sup>36</sup> [https://www.cairn-int.info/article-E\\_POPU\\_1302\\_0215--central-population-registers-as-a-source.htm#](https://www.cairn-int.info/article-E_POPU_1302_0215--central-population-registers-as-a-source.htm#)

<sup>37</sup> Ibid

would include reaching agreement on objectives, data governance and funding arrangements. Allowing sufficient time for public debate is also critical. Moreover, enactment of legislation must be allowed for, business processes set in place, and IT systems built, before a system can be implemented. Further time would be required to consider and resolve a range of statistical methodological issues before statistical outputs based on linked administrative registers are of sufficiently high quality. In an analysis of these issues, New Zealand determined that it did not have the right conditions to move towards a predominantly register-based statistical system.<sup>38</sup> This highlights that the lack of a population register does not preclude investment in other administrative data although this discussion goes beyond the focus of this brief.

### Case Study 5: Producing vital statistics from population registers in Japan

Japan uses two different population registers. The “koseki” or family register records the births, deaths, marriages and divorces of Japanese nationals and represents the CRVS system in Japan. In some sense, it is also a national identity registration, since Japanese public offices collect and maintain these detailed records about all Japanese citizens. Under Family Registration Law, foreign nationals living in Japan also have to notify a municipal office of births and deaths of their family members. When they marry, divorce, or have children, Japanese nationals must notify a municipal office. All this and more are recorded in the “koseki”.<sup>39</sup> However, addresses are registered in a separate register, the “jyuminhyou” or basic resident register. This register is based on the “Basic Resident Registration Act”, which requires residents moving into a municipality to register their address within 14 days of moving. This register can be used to establish internal migration flows.<sup>40</sup>

## 8. Conclusion

Population registers present exciting new opportunities in the production of demographic statistics. Where they exist and are of high enough quality and coverage, NSOs have been able to simplify their data collection work and can produce a wider range of demographic data, more quickly and more cheaply than those who do not have usable population registers. The potential to develop such work further is amplified by opportunities presented by improved data integration techniques. However, legitimate concerns exist over the type of data collected, since the purpose of the data sources feeding a population register is, as a rule, primarily administrative rather than statistical. Additionally, worrying issues around privacy and data confidentiality may also be raised by the use of population registers, especially when integrated with other sources, and need to be addressed with a sufficiently robust legal and regulatory framework. It is also essential that there is public trust that personal data will not be misused by statistical or other institutions.

We appreciate that an effective and fully functional population register is ambitious for most countries. In practice, however, population registers are often constructed gradually, for instance starting with a well-functioning CRVS system and progressively adding other types of information derived from different administrative sources. Thus, recognising the fundamental importance of CRVS systems as the foundation on which population registers can be built, is paramount. The motivation for developing population registers is often around the provision of identity, most recently digital identity. However, despite the crucial roles that civil registration and national identification systems play, these systems are neither functional nor linked to each other in many low- and middle-income countries.

<sup>38</sup> <https://www.stats.govt.nz/assets/Research/A-register-based-census-what-is-the-potential-for-New-Zealand/a-register-based-census-what-is-the-potential-for-new-zealand.pdf>

<sup>39</sup> <http://unstats.un.org/unsd/vitalstatkb/Attachment598.aspx?AttachmentType=1>

<sup>40</sup> <https://www.stat.go.jp/english/data/idou/1.html>

Given the potential of population registers in improving statistical production and the resulting societal benefits, the advantages far outweigh the disadvantages, many of which can be reduced through focused efforts. While population registers are usually established for reasons not related to statistics, these benefits mean that Governments with functional population registers should be strongly encouraged to fully exploit them for producing statistics or, if setting up a population register, to take into account their use for statistical purposes, and make any necessary changes that will facilitate this process. The process should include a robust legal framework and the means to enforce it, including sufficient oversight and processes for correction.

It should also be emphasised that the statistical use of administrative registers will contribute to an improvement of the quality and coverage of these registers. ESCAP and SPC stand ready to support governments to develop population registers which can in turn improve statistical production.

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