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Civil Registration and Vital Statistics as a Tool to Improve Public Management

B. Guy Peters

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Department of Political Science, University of Pittsburgh

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Contact: Juan Cruz Vieyra, juancr@iadb.org.

Abstract*

This paper sets forth a theoretical discussion of a number of specific benefits that can arise through the expansion of civil registration and vital statistics (CRVS) as a way to improve public sector management. It posits that CRVS can be the main source of information to improve policy planning and coordination, as well as increasing transparency and preventing corruption and fraud, among other key features of public sector management. CRVS may supplement the census and other conventional instruments for collecting personal and demographic information on society. The paper also discusses practical ways to maximize the benefits of CRVS and the potential value of civil registration by opening a discussion on the costs and benefits of an expanded utilization of CRVS.

JEL codes: H10, H11, J18, I18
Keywords: civil registration, data management, e-government, government statistics, Latin America and the Caribbean, legal identity, public management, transparency

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Introduction

We are witnessing a data revolution: according to IBM, over 90 percent of the data in the world today have been created in the last two years alone (IBM). Companies, governments, and civil society organizations are increasingly aware of the power of big data and analytics. There is growing attention to the multiple uses of data coming from social media sites, videos, and cell phone GPS signals, among others.

While governments are important producers and users of data, some seem to overlook the enormous potential of an important source of information at their fingertips: civil registration and vital statistics (CRVS). Civil registration, a well-established government activity in many countries, is often limited to the issuance of birth certificates and ID cards, and not considered for its broad linkages with other aspects of social and economic development (Carr-Hill, 2013). Any trip to a registry office, though, will clearly demonstrate its importance for citizens, as they attempt to obtain certification of major life events for purposes of insurance, access to finance, obtaining a passport, or even getting a cell phone.

The Inter-American Development Bank (IDB) sees CRVS as a crucial tool to fight poverty and inequality and a key element of sustainable development in the Latin America and Caribbean (LAC) region. In fact, the IDB has acknowledged over the years that lack of legal identity and birth registration has a direct effect on possibilities and opportunities for full participation in social, political, and economic life (Harbitz and Tamargo, 2009). Children whose births are not registered are essentially invisible to the state and face lifelong exclusion from basic services, such as education, health, conditional cash transfers, pensions, banking, and housing and, in some cases, denial of basic civil rights. For example, the lack of a birth certificate is associated with a reduction in the probability of being enrolled in school, ranging from three percent in Bolivia to 18 percent in Brazil (Brito, Corbacho, and Osorio-Rivas, 2013).

Nevertheless, public sector agencies are often uninformed or lack the institutional capacity to incorporate inputs arising from CRVS systems into their decision making processes. As a result, there is limited awareness of the multiple benefits that diverse agencies can reap through collaboration with civil registries and interconnection with CRVS systems.

The purpose of this paper is twofold. First, it provides a practical analysis of the basic and expanded uses of CRVS. Second, it explains how developing a comprehensive and readily available CRVS information system can provide significant benefits for public planning and policymaking that can exceed the investments required for such a system to function. While the paper is primarily theoretical, it points to a number of avenues for empirical research.

Much of the recent research on civil registration and the role of governments has either emphasized developing CRVS systems with state-of-the art technology or highlighted its linkages with human rights and health issues. This paper seeks to go beyond the traditional applications and justifications for CRVS systems, embracing them as a tool to improve public sector management. These systems are an essential source of information for designing and implementing public policies, supplementing the census and other conventional instruments for collecting personal and demographic information. In addition, coupling big data and analytics with civil registration can enable governments to identify social patterns and proactively enhance programs and infrastructure with the aim of better serving rapidly changing populations. Using CRVS creatively across sectors of the economy can improve the quality of management and reduce the total cost to the government of collecting information.

This paper is structured in three parts. Part 1 delineates the basic uses of CRVS as a tool for identity management and makes the case for expanding these basic uses to improve the efficiency and effectiveness of government. It identifies the benefits of an enhanced use of CRVS systems and provides examples of sectors where enhanced CRVS have been and can be used, and countries where they have yielded results that could be extrapolated in other countries. Examples of public policy benefits include controlling corruption, promoting equality, coordinating policy, and informing decision-making processes.

Part 2 discusses the requirements for making CRVS systems effective. Most importantly, it analyzes the potential policy and administrative benefits of effective civil registration, especially in low- and middle-income countries. The paper highlights critical implications of CRVS systems that can lead to overall improvements in government performance. Although the emphasis is on LAC, the same logic applies in other regions of the world. While more developed countries have effective civil registration systems, they may not be using them as fully and creatively as they could.

Part 3 considers the costs and benefits of developing and enhancing the use of CRVS systems. Some of the benefits of improved CRVS systems are difficult to quantify and may only accrue over time. On the other hand, the costs of improving these systems are borne in the short term. Therefore, government officials who are committed to improving this data and using them more effectively will have a significant advocacy challenge.

Finally, the paper discusses a set of considerations that governments should take into account when expanding the use of CRVS systems, such as balancing between protecting civil liberties and collecting data, between reducing complexity and ensuring the thoroughness of the

information gathered, and between using resources for improving CRVS or using them for competing policy goals. The paper concludes that, while enhanced CRVS systems are not a panacea, their use can greatly enhance the functioning of government.

Juan Cruz Vieyra
Modernization of the State Specialist
Institutional Capacity of the State Division
Inter-American Development Bank

1. The Uses of Civil Registration

The daily collection of information through civil registration has been used for decades for some aspects of public policy in the form of vital statistics. These indicators are used most frequently in health policy. Indicators such as infant mortality and general mortality rates are measured primarily through civil registration information (death certificates) and are used to compare healthcare systems over time and across countries. In policy areas, such as family policy and gender equality, information on marriage and fertility are also indicators of social trends that may require intervention by the public sector.[1] There is an established pattern of using these data for planning and policymaking in many countries. South Africa, for example, uses civil registration data to plan aspects of health care, such as the stocking of pharmaceuticals, which produces significant cost savings. If high-quality civil registration data were available throughout the LAC region, planning for similar aspects of health care, as well as education and transportation, would be possible.

This paper addresses civil registration activities at three levels of development and aggregation: (i) Basic Identification: This is the basic registration of life events, such as births and deaths. Having a birth certificate is a basic level of registration that establishes a person's identity. (ii) Expanded Use of Civil Registration: At the next level, that birth certificate becomes the entry into a national identity system, whether that system is in the form of national identity cards, driver's licenses, passports, or, as in Mexico, a voting card.[2] These identity certificates then provide the means for obtaining other services from the government and from the private sector. This enhances people's ability to take advantage of expanded uses of civil registration information, described below.[3] Identification of life events is important, but using that information—notably birth registration—to provide individuals with identity documents makes this information all the more useful.

Individual events are aggregated into vital statistics, which provide rates of occurrence of those events and aggregate changes in society as a whole, which also facilitates the use of expanded utilization of civil registration. The primary focus of civil registration has been on providing every citizen with an identity. While this is a crucial activity for the public sector and a

[1] For example, the current decline in fertility in most industrialized democracies has led a policy discussion about the means of arresting the decline in the population or finding ways of adjusting to a declining workforce. See *The Economist* (2015).

[2] For example, in Peru a child is first given a certificate of live birth, after which a birth certificate can be obtained. With that birth certificate, the child can obtain the national identity card that is required to access many public and private services.

[3] For example, in some countries, including a number in Latin America, having an identity card may be a requirement for obtaining a cell phone.

basic right of citizens, the aggregated statistics that can emerge from these individual events are useful for understanding changes over time as well as differences across areas within a country. Therefore, these vital statistics can be extremely useful for planning and policymaking.

Despite the importance of civil registration for citizens and governments, a significant proportion of the world's population is not included in any registration system. According to the World Health Organization (WHO), globally an estimated 48 million births each year and an estimated 38 million deaths are unregistered. That is, some 40 percent of births and 66 percent of deaths are not yet recorded. UNICEF estimates that 44 percent of children in Sub-Saharan Africa and 61 percent of children in South Asia are unregistered. While these unregistered events are concentrated in poorer countries, there are significant variations within more affluent countries with generally successful registration systems. Rural areas with large concentrations of poor and indigenous populations tend to be less well covered by civil registration than more affluent, urban areas. Thus, a significant investment is required to extend the coverage of registration systems.

This lack of full coverage makes the statistics from poorer countries less reliable than would be desirable. It also highlights the need for investment in better registration of all vital events. Presently, mortality rates are only estimates. They are more reliable for tracking changes over time within a single country than for comparing countries to one another.

Although this paper does not directly address mechanisms for improving registration rates, the disparities in registration are important for understanding the utility of existing registration systems and their capacity to inform government policymaking. If the registration information is skewed, then the policy recommendations made based on that information would also be skewed and unlikely to provide reliable information on which to base public policies. Given existing disparities in the population being registered, these data may tend to skew government attention toward areas that are already well served.

The level of data collection may also affect the accuracy and utility of CRVS. In Mexico, for example, civil registration is conducted at the state level. This has meant that in more affluent areas, such as the Federal District and Nuevo Leon, birth registration is complete, electronic, and entered into the national registry almost immediately. In poorer, rural states, such as Chiapas and Tabasco, registration appears to be neither complete nor digitalized in a speedy manner (if at all).[4] In addition to being necessary for ensuring the completeness of the

[4] This conclusion is based on a personal interview with Lic. Héctor Maldonado San Germain, Central Judge, Civil Registry of the Federal District, Mexico.

database, efforts to reach these less affluent and remote regions are important for ensuring equity for the population. There also are differences among states in the way they define registration, further complicating the creation of a common national system.

Many governments continue to rely on census data to understand population trends within their societies. While these may be the most comprehensive sources of data, they present several crucial difficulties for government. First, they are expensive if they are to be accurate. Even sample surveys for census purposes can be very expensive, and any attempt at a full census is even more so. Second, in part because of the cost, censuses tend to be taken only infrequently. Therefore, by the time a subsequent census is undertaken, the data from the older census will be far out of date, and it may even be out of date when it is first released after processing. Additionally, the census may not always ask the questions that are most important for policy formulation. Finally, the census is intrusive, and citizens may be hesitant to answer questions about things that governments would like to know (Prewitt, 2004). In summary, as the WHO (2015: 3) has argued:

> Unlike other sources of vital statistics, such as censuses and household surveys, the data from Civil Registration and Vital Statistics (CRVS) systems permit the production of statistics on population dynamics, health, and inequities in service delivery on a continuous basis for the country as a whole and for local administrative subdivisions. This provides more accurate information and the "denominator" for assessing progress with plans across sectors for improving economic growth and reducing poverty.

Thus, the continuous nature of data collection through civil registration provides a more up-to-date and less expensive means of addressing the need for population information than a population census performed once a decade. Practices of this sort are already in place in Scandinavia, providing a better ongoing picture of movements in society.

1.1 Identification

The most obvious use of civil registration information is to attach a discrete legal identity to every individual in society. While having an identity is common for citizens in many countries, for many countries the extent of civil registration can be limited. These limitations exist not only because of the social, economic, and geographic barriers already mentioned, but also because of complex registration processes. In many countries, such as Peru and Ecuador, obtaining an identity card involves multiple stages. Thus, many citizens may believe that they or their children are registered when they have only completed part of the process.

The basic identity provided to individuals through civil registration can be used in a variety of ways and can therefore be used to supplement other forms of registration of citizens. For example, in our study of birth registration in Ghana, we found that there were a number of expensive and confusing identity systems running in parallel in the country (civil registration, health, social insurance, voting, etc.) (Peters and Mawson, 2015a). In the LAC region, Jamaica exhibits a similar pattern. By contrast, Haiti has been able to construct a common identity system (for people over 18) with a limited CRVS system.

A focus on basic identity would have provided a workable identity for all citizens at a significantly lower cost.[5] Some more affluent countries, such as the United Kingdom, do not issue a single identity document, which imposes costs due to the redundancy of registration activities. This has appeared to function adequately, albeit with some problems encountered because of increased movements of people within the European Union. More than having a single identity system, however, the most important point is to have a universal foundation for identity, such as CRVS.

1.2 Expanded Use of Civil Registration

Although the basic uses of CRVS are important for governments and for citizens, this paper is concerned with expanding that usage and using CRVS information more creatively to improve public sector management. The five possible extensions of the use of these data are: (i) promoting equality, (ii) increased transparency, (iii) controlling fraud and corruption, (iv) increasing policy coordination, and (v) improving policy planning. Each of these extended uses can contribute to more effective public sector management, whether in countries in the LAC region or elsewhere. The contributions that civil registration can make in each area will be explained below.

1.1.1 Promoting Equality

Most governments have some form of internal financial transfers among regions to promote greater equality of services, or simply to support basic public sector programs on a per capita basis. For these transfer programs to be effective, there must be some means of locating

[5] This may be to some extent a "chicken and egg" problem. The absence of an effective civil registration system encouraged other organizations to create their own systems, and once those were established there seemed to be less need to invest heavily in creating a single identity system based on civil registration. Having a single integrated identity system would be much more efficient than multiple systems, but once established, eliminating multiple systems may be difficult.

people and discovering where the greatest population changes are occurring. Many countries, even affluent ones, continue to rely on census data or household survey data to identify those population changes, but civil registration can provide a timelier basis for making the allocations.

In addition to the formal and financial aspects of promoting equality within the population, civil registration may also be a symbolic means of promoting equality. In most societies, the groups that are least likely to be registered and to have full identities in a national population registry are also those that may be excluded from the dominant society for any number of reasons—poverty, geographic isolation, violation of social norms on sexual preference, and others. By making efforts to include these segments of the population, governments can provide more accurate information on the population and assist in altering patterns of social exclusion.

For programs supporting equality in public services to be effective, there needs to be greater equality in registration. In Latin America, there are particular problems in registering indigenous populations, while in many areas of the world there are marked disparities in registration between urban and rural areas and between affluent and poor areas. Therefore, if information is to be used to promote greater equality, it will be necessary to have adequate registration in all areas of the country and of all groups within the country. This may require that civil registries become even more proactive in seeking out excluded populations rather than relying on those groups to present themselves for registration.

One good example of these inequities can be observed in Brazil. Brazil has an administrative registry system (Registro Administrativo de Nascimento Indigena, or RANI) for the indigenous population, but it is not equivalent to the birth registration and identity system (Rasella, Aquino, and Barrreto, 2010). Thus, members of indigenous communities may believe that they are registered but, in fact, they may not be eligible for major public sector benefit programs, such as Bolsa Familia. Another example can be found in an IDB study on the Dominican Republic (Corbacho, Brito, and Osorio-Rivas, 2013), which concludes that children who lack birth certificates receive between one half and one fewer vaccines on average than those who are registered.

1.1.2 Increasing Transparency

An effective civil registration system can also be used to promote greater transparency and openness in government, and to limit the ability of governments to suppress information, at least about population changes and inequality. This use of civil registration may be more relevant for

death registration than for other components of civil registration. At the most basic level, knowing death rates, and especially infant and neonatal mortality rates, may make it difficult for governments to make erroneous claims about the quality of the health system or improvements in the health system. Having this information available does not mean, however, that it will be used effectively. In the United States, it has been known for decades that infant mortality rates are higher than they should be, given the wealth of the country and spending on healthcare, but the government has done little about it. Thus, the availability of the data may be a necessary but not sufficient condition for action on these policy problems.

At a more detailed level, cause-of-death statistics can be used to identify particular failings in the health care system, even when exposing those failings could embarrass the sitting government. For example, the international community criticized the Government of South Africa for continuing to claim that HIV/AIDS was not a problem in the country after a well-functioning death registration system was introduced using WHO standard definitions (HMN, 2012a). When it became clear soon thereafter that there were numerous deaths from that disease, the government was pressured to intervene substantially. The information alone might not have produced the change, but it may have been a necessary condition.

As Setel et al. (2007) have argued, not registering citizens and especially children creates a “scandal of invisibility” in which people simply do not appear on the cognitive maps of decisionmakers in the public sector, or even of NGOs and therefore are irrelevant to those decisionmakers. Thus, the issue of transparency in relation to civil registration is not only making the actions of government visible to society, but also making society visible to the government. Unless each set of actors is aware of the other and understands changes in the other, effective management is not likely to occur.

Transparency in civil registration is a two-way street. While transparency can improve the capacity of the public to monitor their governments, it can also improve the quality of registration statistics, and consequently, the quality of services provided to citizens. In Chile, for example, making civil registration information publicly available has led to some improvements in the information included in the registration database, especially on children. Citizens have been able to identify mistakes in the information relating to them and their families and to have the errors corrected. These corrections, in turn, appear to be related to improvements in healthcare services provided to newborns (Setel et al., 2007).

1.1.3 Controlling Corruption and Fraud

Corruption is a continuing problem in many countries, and an effective civil registration system may provide some relief from this endemic problem. There are two dimensions of corruption and fraud where civil registration can play an important role. The first and more obvious one is that having clients of programs with unique identity numbers will make reducing benefit fraud easier. If a client must present an identity card to receive a benefit, then receiving that benefit multiple times becomes difficult unless there have been failures in the registration system, such as, for example, if the same individual obtains multiple identity cards. As conditional cash transfers become a common means of providing social benefits in Latin America (Stampini and Tornarolli, 2012), effective civil registration systems provide the most efficient means of identity control, helping both to reduce fraud and to determine eligibility for these benefits in the first place, in addition to facilitating administrative and legal eligibility proceedings (Teichman, 2008).

While much of the emphasis on identity registration has been on establishing the identity of children, death registration is equally important for preventing benefit fraud. There are numerous reports of people long dead continuing to collect pensions and other social benefits from the government because the death registration system is not adequate to register those deaths and make the information available to the government agencies that distribute pensions. The relatively high level of unreported deaths in Latin American countries compounds this problem (Queiroz, Gonzaga, and Campos de Lima, 2013).

It is estimated that significant savings could be achieved in the public sector if death registration systems were more effective in Latin American and other middle-income countries. Some of the same linkages between agencies and CRVS systems discussed for birth registration could also be useful in making death information available to governments. In Uruguay, for example, around 35 percent of death certificates are electronic. The issuance of this certificate through the system generates online transmission of data to public and private institutions that require information related to this event (Tomasso and Rodriguez, 2015).

In addition to controlling potential benefit fraud committed by citizens, having an effective civil registration system and unique identities helps protect citizens from solicitations of bribes or other considerations from public-sector workers. If civil servants who might attempt to extract bribes must identify themselves to the clients, then some control over the behavior of these officials is possible. That will, of course, depend on the clients' willingness to identify officials who have sought bribes, which they may fear could affect their future possibilities of receiving benefits.

1.1.4 Increasing Policy Coordination

Policy coordination is a continuing challenge for governments (Peters, 2015). The numerous specialized organizations within governments tend to encounter difficulties in forging cooperation and policy integration. While the reasons for this lack of coordination are numerous, one of the most important reasons is lack of information about the "whole client" and the multiple needs that many clients of public programs have (Armstrong, 2010). Healthcare organizations, for example, conceptualize their clients in terms of their health needs and ignore their educational, social service, and labor market needs (and many others).

Having an effective and essentially complete civil registration system can facilitate coordination of services for both providers and citizens. For providers, having the identity of the individual can enable them to determine what other services have been accessed and the range of needs of the client. This may contribute to better assessments of the costs of service delivery. Even within a single policy area, having access to more complete information about the client can facilitate care. For example, if an individual visits several health facilities and receives medications from each, having access to that information may prevent doctors from prescribing medications with dangerous interactions. This information might also prevent an individual from abusing the system, for example, by receiving multiple prescriptions for opioids.

When multiple policy areas are involved, the need for policy coordination is even more apparent and important. The need to link programs is most evident with respect to social services, because citizens requiring social benefits often must obtain them from multiple programs. The capacity to link information on the services received and to manage eligibility using a unique identity is crucial. The identification of use patterns across these programs can help policy planners as well as individual facilities charged with providing benefits to citizens. The presence of common identity systems could also make some aspects of data sharing virtually automatic, bypassing the reluctance of some actors to cooperate.

The capacity to coordinate through identity systems is not limited to providing social benefits for citizens. For example, a number of cases of child abuse have had tragic results because of the failure of various service providers (e.g., schools, hospitals, social workers, police) to coordinate around the child (Marinetto, 2011). Having a discrete identity for the child in question might have enabled the authorities to link the multiple instances in which the child presented with symptoms of abuse, and could have facilitated removal of the child from the abusive situation. For citizens, the benefits of having a defined and unique identity are analogous to those of service providers. Without the identity system provided through civil

registration, citizens might have to seek out individual services and programs and complete multiple repetitive forms. Having one unique and legal identification per individual can mean that many of the potential redundancies in government forms could be eliminated, assuming that interoperability of information systems within the public sector is possible.

1.1.5 Improving Policy Planning

Relying on a census for population data is almost certainly going to mean relying on outdated information about society. Even developed countries, such as the United States and the United Kingdom, with decennial censuses, must rely on data that are woefully outdated. Even with traditional paper-and-pencil methods of initial data collection, civil registration provides a flow of information for government that is close to real time. Digitalized systems provide information much faster, so that a child born today may be recognized as an individual member of society on the same day. The difficulty and costs arise in moving information from traditional to digitalized registration systems that provide policymakers with real-time information.

The enhanced use of even non-digitalized information derived from CRVS systems can improve the timeliness of the data used for policymaking. Since these data will be collected for purposes of registration anyway, they require limited additional investment. If used carefully, CRVS data can provide a continuous picture of demographic and social change in the country, and in regions of a country, that can significantly improve the timeliness of government decisionmaking.

In summary, the above-described benefits accruing to government and to citizens from an enhanced CRVS system demonstrate how these data can be used to improve management. In addition to their fundamental purpose of conferring a legal identity, well-functioning civil registration systems can assist governments in performing their tasks more efficiently and effectively. For those benefits to materialize, however, it may be necessary to improve the quality of CRVS systems.

2. Making Civil Registration Work

While improving CRVS systems has the potential to augment the census and household surveys in determining population size and status, their full potential can only be reached if certain conditions are met. Likewise, the capacity of civil registration to achieve some of the policy benefits mentioned above will depend upon the features of the registration systems. While some of these features may appear obvious, they should be considered when designing

civil registration systems and linking them with other components of the public sector. These features are: (i) population coverage, (ii) range of information, (iii) timeliness, (iv) interoperability with other databases, (v) shared metrics, (vi) legal simplification, and (vi) digitalization.

2.1 Population Coverage

The first consideration in making civil registration a viable complement to the census is that the coverage of the population be complete. While we know that census coverage may not be complete (Siegel, 2010), often excluding vulnerable populations, civil registration should attempt to achieve at least the same level of coverage as the census. Civil registration carries the same risk as the census in failing to identify marginalized segments of the population, whether they are marginalized for economic, geographic, or cultural reasons.[6] The continuous nature of civil registration will provide more opportunities to include missing citizens in the registration process. Further, citizens may have some incentives to register themselves and their children that do not exist when simply answering census questions.

The available evidence shows that in many countries, the level of birth registration has been increasing rapidly and in many Latin American countries appears to be virtually complete (UNICEF, 2011). Likewise, death statistics are becoming more complete, with respect to both the recording of deaths and the information concerning causes of death. The group that is most absent from the official enumerations of society today is middle-aged people and the elderly, whose birth preceded the improvements in birth registration processes, especially in less-developed countries. Interactions with other sources of government data may assist in identifying those missing citizens and including them in the national database.

2.2 Range of Information

There is a second dimension to the completeness of registration systems. If civil registration systems are to be suitable supplements to the census and household surveys, they need to collect a significant amount of additional information that may be potentially useful for planning and for policymaking more generally. For example, cause-of-death information is important and can be collected along with gross death information. Similarly, collecting data on the characteristics of the parents of newborn children can enhance simple birth registration.

[6] Some societies may attempt to hide handicapped children because of cultural aversion to these people when they are born, with the result that they will not be included in the civil registry (Interview with Norma Guaderejes, Civil Registry, Quito, Ecuador).

Knowing the identity of the parents of the child who is registered and being able to link them to the locality in which they reside and even their occupational status can provide substantial evidence about geographical mobility, economic change, and general social changes such as changes in mortality. While in some circumstances even obtaining a registration for the newborn child is a significant achievement for the registration system, collecting more details can significantly enhance the government's up-to-date knowledge about the population. In countries such as Uruguay that obtain information on parents and their addresses, this information is used primarily to be able to locate the newborn for health checkups rather than for purposes of public planning.[7]

2.3 Timeliness

As implied throughout this paper, one of the major possible advantages of civil registration when compared to other methods of tracking population numbers and characteristics is that it is more likely to provide timely information than are other methods of collecting information about the population. Therefore, one of the crucial attributes of any civil registration system is that it be timely. The information that governments may wish to have to formulate their decisions must be as accurate as possible and available at the time that the decisions are being made.

To some extent, the timeliness of information in civil registration systems is dependent upon digitalization. There may be other factors, however, that affect how readily new information on the population is made available to decisionmakers in the public sector. Even if information collection is not automated at hospitals or other locations with a significant number of births and deaths, information can be processed more or less quickly, and efforts can and must be made to integrate information from the more remote areas of a country into the national database quickly.

The size of the country and the degree of decentralization can play an important role in the timeliness of information in civil registration databases. For example, Mexico is a large, federal country in which the civil registration function is assigned to the constituent states. While information in Mexico City and Monterrey, for example, is already digitalized and available almost immediately for planning purposes, information from states such as Oaxaca may not be available for months after its collection. If the states have primary responsibility for civil registration, then data sharing may present some barriers to developing national profiles. Even

[7] Telephone interview with Ms. Cristina Tello, from the Office of Budget, Control and Management Evaluation, Government of Uruguay.

in unitary regimes, such as Peru, that rely on local governments for information collection in remote areas, the timeliness of data on the country as a whole may be in question (Peters and Mawson, 2015b).

2.4 Interoperability with Other Databases

While not directly related to the capacity of civil registration to complement the census and/or household surveys, the capacity of civil registration to realize some of its other potential policy benefits depends on the extent to which information from this source can be linked to other sources of information held within the public sector. For example, simply knowing that an individual is alive (through the information supplied at the birth of his or her child) but not registered in the tax or employment rolls can raise questions about employment in the black economy. Additionally, identifying an individual who appears in the employment records but not in the national registration database will enable identification of individuals who need to be included.

Much of the discussion on the interoperability of information systems concerned with civil registration has had to do with healthcare systems, but the principle can be applied more generally (WHO, 2015). In addition to involving healthcare systems, having close connections with education will also facilitate registration of children who were not properly registered at birth. Registration data can also be important for social programs such as family support programs.

The possibility of sharing data across government departments, or even between the public and private sectors, raises a number of difficult legal and ethical issues. Germany and many other European countries have laws that virtually forbid information sharing across data systems, and data sharing is limited in the United States and Canada (Cavoukian and Jones, 2012). Even if data sharing were legal, ethical concerns about privacy and individual autonomy might make such exchanges of information suspect. Countries with more statist traditions might find a more intrusive role for the State to be more acceptable, but international practice increasingly limits such exchanges (OECD, 2013).

At a minimum, linking even aggregated data coming from several sources, such as civil registration, employment, and taxation, can help track general levels of movement in society and plan public policies more adequately. For example, a simple pattern in which the population appears to be increasing in one geographic area and employment is increasing in another nearby area has clear implications for planning transportation, as well as schools, hospitals, and

other social infrastructure. Likewise, identifying patterns of deaths by cause of death can assist in controlling infectious diseases. The administrative data are complete enough in some Nordic countries that they have eliminated their census.

2.5 Shared Metrics

Although less relevant for measurement within a single country, the use of common metrics is important from an international perspective. Within a single country, it is important that the measurements used remain as consistent as possible over time. While the identity of the individual may not be in question, the capacity to use vital statistics for planning and evaluation purposes will be limited if the measures used are not consistent. For example, WHO has been stressing the use of common cause-of-death classifications in all countries so that progress in health conditions can be effectively monitored.

This variation among countries in terms of the measurements used in civil registration and vital statistics often occurs even among developed countries, sometimes confounding the understanding of health status and policy planning (Lopez, 2010). Even well-established indicators, such as infant mortality, can be calculated differently in different systems, producing assessments that are unfounded, or at least reducing the differences that may appear to occur in health systems (MacDorman and Matthews, 2009). Therefore, extensive efforts must be made to ensure the quality of the measurements used and the comparability of the information being collected.

2.6 Legal Simplification

Most civil registration systems place the onus of registering a child, or themselves, on individual citizens. While that rather passive role played by government in achieving registration may be acceptable, the current registration system in many countries may make registration unnecessarily cumbersome (Harbitz, 2012). For example, in some Latin American countries, such as Peru, three steps are required to obtain an official identity card. First, the baby requires a certificate of live birth. That certificate can then be used to obtain a birth certificate. The birth certificate is required to obtain the national identity number. One or two of those steps could be eliminated and the process streamlined to facilitate more registrations. Eliminating the certificate of live birth stage and going directly to issuing a birth certificate would simplify the process with little loss of information.

In addition to the multiple steps involved in the normal civil registration processes, legal barriers may make registration of individuals even more difficult. Despite the best efforts of government registrars, they sometimes make mistakes. Correcting them often involves extensive interactions with the legal system and may require that citizen pay legal fees. If the registration process is opened up to more sources of registration that may not be as committed to the details of the system as are members of the civil registration organization, then those errors are likely to proliferate. Thus, there may be some tradeoffs between an emphasis on developing new mechanisms for registration and the accuracy of the registration information.

The desirability of legal simplification is closely related to the need to simplify the administrative structures within government that deal with CRVS. In some Latin American countries, several organizations are involved in civil registration. For example, there may be one organization responsible for the actual registration process while another is responsible for issuing personal identity cards. This separation of functions corresponds to the agency logic characteristic of New Public Management and disseminated through donor organizations, but it imposes additional coordination demands to make civil registration effective (Gruening, 2001).

2.7 Digitalization

Finally, it is clear that a great deal of time and money is now being invested in the digitalization of civil registration information in a large number of countries (WHO, 2013). For example, investments have been made in Chile's Civil Registration and Identification Service and Uruguay's Civil Registry. Birth registration rates in these countries compare favorably with those found in Organisation for Economic Co-operation and Development (OECD) countries[8] (Brito, Corbacho, and Osorio-Rivas, 2013). The development of these databases will ultimately facilitate the collection and processing of civil registration data. While the long-term benefits of digitalization are unquestionable, there are questions about the priority that should be given to digitalization versus more basic methods of data collection that can produce benefits (at least for individuals if not for the public sector) in the shorter term. While registering people through pen-and-paper methods may be easier in some areas, moving the data into more directly usable forms will require more steps and may result in more errors.

[8] Until recently, governments did not fully comprehend the implications of universal and timely civil registration as a matter of public interest, and the subject was absent from political agendas. This means that many civil registration systems in the LAC region suffered from both financial and institutional neglect. Recent developments have shown that the trend is changing.

The main issue appears to be how governments should invest their resources to improve the quality of civil registration. Some evidence from fieldwork concerning birth registration in several countries (Peters and Mawson, 2015a; 2015b) is that investment in high-tech solutions to registration problems may come at the expense of basic coverage. The most significant problems in registration arise in remote areas, where at least initially digital registration may be impossible or more unreliable than traditional methods. One can easily argue that it is more important to expand coverage than to have a smaller portion of the population covered by a digital system. This is especially true given that a disproportionate number of the socially marginalized citizens reside in the more remote areas.

Although the full-scale technological solution may be expensive and difficult to implement in more remote areas, the use of widely available cell phone technology may be a reasonable substitute. The use of cell phones can enable remote health facilities, or civil registrars, to insert data into the national registry immediately. Some African countries, such as Uganda, are using cell phone technology to expedite registration and data collection (UNICEF, 2013). The use of this technology, however, opens the system to greater threats to privacy and security of the information held by the government.

The ultimate goal of improving civil registration systems may be to digitalize them. In the short term, however, a tradeoff between that final goal and the more immediate need to include as much of the population as possible is very apparent. The goal of complete coverage, or as complete as possible, may override the goal of full digitalization until there is nearly full coverage. Emphasizing the development of modern information systems may mean that civil registration does not adequately cover citizens in more remote areas for a longer period, whereas for their sake and for the sake of policymaking, increasing coverage should be the priority. The question then becomes how best to make information for planning and administration available to other public sector organizations before it becomes available in electronic form. Along with that, there is the question of how timely this information can be.

3. Benefits and Costs of Civil Registration

From the discussion up to this point, it should be clear that investing in high-quality forms of civil registration, as in any government program, will have costs and benefits that need to be considered carefully before going forward with the program. Empirical calculation of those costs and benefits is beyond the scope of this paper. However, this process can begin by identifying the major costs and benefits and attempting to develop some sense of their relative magnitude.

This discussion of costs and benefits is premised on the previous discussion of the policy goal of ensuring that the entire population of a country is covered in the CRVS enumeration. This goal should be pursued even when some segments of the population may be difficult to reach and to register. This discussion is further premised on an assumption that to have the greatest utility for other organizations and programs within the public sector, the civil registration system will need to be fully digitalized. There must be a strategic choice of whether to invest more heavily in full coverage of the population or to invest more immediately in higher levels of technology.

The costs of improved registration will depend upon several factors. The first factor is the extent of investment in technology. If the intention of the improvement in the CRVS system is to provide virtual real-time availability of information across the entire country, then this will involve not only central processing capacity but also direct linkages with every point of registration across the country. If the benefits of online registration are to be attained, this expansion of services will involve a large number of access points in hospitals and other healthcare facilities as well as in formal registration offices. Because some of these registration areas may be far from the national capital and from high-speed Internet infrastructure, these costs could be significant. To the initial investment must be added the costs of maintenance and continuous upgrades. While full coverage is more important than speed, having the most up-to-date information available is still important.

The second major cost for the program will be reaching the more remote areas of the country and identifying and registering vulnerable populations. Most countries have been able to achieve high levels of registration in their urban areas, except in some slum areas. Levels of registration in rural areas, especially in Amazonia and the highlands, are much lower. In these regions, the costs of registering each individual are much higher than in the urban areas and may involve extensive travel to reach remote villages. Thus, while for several reasons it is important to extend coverage to the entire population, doing so will add significantly to the costs. Although less expensive, adding vulnerable populations in urban areas will also impose greater per capita costs than for the most of the population.

The principal benefit of creating full civil registration, at least in economic terms, will be avoiding some of the costs of censuses and household surveys. These exercises in enumerating the population can be very expensive, especially when efforts are made to include the harder-to-reach segments of the population and when a large sample or a full counting is involved. Some estimates of the differences in costs show that the savings from relying more

heavily on civil registration will be substantial. For example, one study identified the cost of civil registration systems to be just over half the cost of other forms of data collection on populations (Health Metrics Network, 2012b). The civil registration system may have to be augmented by other data from administrative sources to provide a full picture of the population. These data may be available through normal administrative channels, and specialized surveys will be required from time to time, but total information costs can be reduced.

The second major benefit of undertaking a more complete registration process for enumerating the population is that more accurate and timely information will be available for policymaking. The economic justification of this benefit is more difficult to estimate than the others, even though the others have their own challenges. These benefits may include reduced congestion if transportation planning is more accurate and even some benefits to health if hospital and clinic capacity is coordinated with population changes. The information coming from civil registration will never be complete, especially for highly mobile segments of the population, but it will generally be more up to date than other sources of data for planning purposes.

In addition to making policy decisions more timely and effective, civil registration systems can also increase the efficiency of service delivery. For example, having children registered can facilitate immunization programs, especially those that require high levels of coverage to be effective. Knowing the identities and residences of children will enable immunization workers to locate and vaccinate them, thus reducing total costs and accelerating the process. One study in rural Mali found that the cost of immunization without an effective registration system was approximately US$2.79, while the cost with registration was US$1.47 per child (Jamison, 2006).

The third benefit of a comprehensive CRVS system is the ability to avoid having multiple registration systems within a single country. Some countries with relatively weak civil registration systems have been forced to construct separate registration systems for health, social policy, and voting, and for other government functions. This duplication is wasteful; hence, creating a single effective registration system will almost certainly reduce total costs for identification systems within the public sector, although it will also shift the locus of those costs to different units of the public sector.

The fourth benefit of an effective civil registration system is the potential to reduce benefit fraud and potentially other sources of corruption in the public sector. Having a unique identity for each citizen makes it more difficult for individuals to claim multiple benefits, but of

course that in turn depends upon having a complete and well-designed registration system that can provide mutually exclusive and collectively exhaustive identities for citizens. In addition to reducing benefit fraud within the public sector, an effective civil registration and identity system can also be used to reduce identity fraud in the private sector, an increasing problem in most societies (Australian Bureau of Statistics, 2010).

Finally, there can be significant public health benefits from enhanced registration programs. Epidemics remain a significant health problem, especially in developing countries. Accurate population and cause-of-death statistics provide substantial assistance in assessing the spread of diseases and the likely consequences (Mikkelsen, Lopez, and Phillips, 2015). While obviously not combatting diseases directly, this information helps to provide accurate information to design strategies that address the health and social problems involved.

3.1 Other Issues when Analyzing Costs and Benefits

There are additional technical issues that should be taken into consideration when calculating the value of these costs and benefits of upgrading CRVS systems. One of them is how to assign value to aspects that are difficult to quantify in monetary terms. The most obvious of these is how to value life (Sunstein, 2013). Because improved registration and vital statistics may contribute to maintaining health and life, those measurements matter, as do other benefits, such as social inclusion and citizenship. Thus, any empirical cost-benefit analysis of civil registration will involve assigning monetary values to a number of non-marketable goods.

Time is another important element in the calculations, and with it comes the need to calculate the net present value of any future costs and benefits. Investing in civil registration, whether in computer and information technology or in the human resources necessary to visit and register vulnerable populations, incurs costs immediately while the benefits may not accrue for months or years. While technically these differences in the perception of time can be understood, and some social discount rate can be applied to assess them, investing in future benefits will remain difficult politically (Moore et al., 2004). Cost-benefit analysis is a standard evaluation technique for public policies that provides the decisionmaker with some assessment of the economic effects of a program. These economic assessments are important, but they also involve translating a number of non-marketed values into monetary terms. This compilation provides an answer about the desirability of a program, but that answer contains a number of inherent assumptions that can bring the values into question. The attempt to enumerate costs and benefits for civil registration in this paper does not attach monetary values, but identifying

relevant factors is the first step toward arriving at a quantitative answer.

Identifying the costs and benefits of enhancing CRVS investments by governments in the region is also a useful way to summarize the arguments made in this paper. The paper has primarily been advocating for increased investments in civil registration, but these investments are not without their costs. Although CRVS is not as expensive as other means of maintaining an enumeration of the population and its characteristics, governments will have to devote substantial energy and money into making a CRVS system perform in a manner that can make it worth the investment involved.

Even though it is difficult to precisely quantify the costs and benefits of enhanced CRVS systems, it is clear that there are real benefits that can exceed the usual intent of simply enumerating the population. These benefits should be made more apparent to decisionmakers in government, not only to strengthen the development of these CRVS systems but also to encourage their greater utilization across ministries and agencies within the government. Although fully digitalizing these systems and making them readily available can be expensive, these costs can be offset by improved planning and use of resources in a wide range of government programs.

The benefits of more effective civil registration systems are difficult to quantify and more remote in time than are the costs of improving the system. Hence, the policymaking benefits and political demands for registration become more significant. The benefits accrue to a number of different organizations and appear through greater efficiency and more effective planning of public services, while the costs are very direct and more readily calculable. This apparent imbalance of costs and benefits places a clear burden on advocates, who must explain the virtues of enhancing the CRVS system.

Civil registration is not a high-profile activity within the public sector compared to activities such as national defense, law enforcement, or social programs. Therefore, more effort must be exerted to influence the political system to provide the necessary resources to make the CRVS systems as effective as possible. Demonstrating the utility of the information about the public obtained through these systems for the rest of the government, and especially for purposes such as reducing benefit fraud, can be used to construct political coalitions to support these efforts at improving civil registration.

4. Final Remarks

To the extent that governments and international organizations have been interested in civil registration, or more broadly CRVS, they have been concerned with two important dimensions of this process. First, they have been concerned with ensuring human rights. UNICEF, for example, identifies the right to a name as the first right of the child, with birth registration being the means of securing that right (UNICEF, 2014). Other forms of civil registration, such as marriage, also confer rights to citizens, such as access to certain social benefits and inheritance.[9] The rights associated with registration may have to be enforced through more practical means, but there is a close link between having a legal identity and having the rights of citizenship.

The second dimension of the concern with civil registration has been the importance of these activities for the health sector. Organizations such as WHO support these concerns. Civil registration has been important for monitoring infant mortality and other standard indicators of health service delivery. When extended to the other end of life to cover causes of death, civil registration can provide strong epidemiological evidence to understand the spread and effects of disease and the efficiency of the health care system.

Although the rights and health components of civil registration are usually emphasized, as discussed in this paper, these activities of the public sector also have very clear practical consequences for citizens and governments alike. Civil registration provides governments with information about their populations and about changes in those populations, which enables governments to plan and implement public policies more effectively. Civil registration also enables governments to manage eligibility for public programs more effectively and to prevent fraud and abuse in those programs.

One question that arises from the emphasis on registration and identification concerns is how far that identification extends within the administrative system. Some of the benefits of effective registration systems come from citizens having unique identification numbers that are used in a wide variety of public and private settings. Dependence on those numbers, however, raises questions about civil liberties and the excessive ease in linking data about citizens. The choice of how much to depend on identity cards resulting from civil registration is to some extent culturally dependent, with some countries being more protective of privacy and civil liberties than others.

[9]For that reason, civil registration has been of central importance in the political battles over same-sex marriage in the United States and other countries. See CBO (2007).

Some of the most beneficial uses of civil registration information will require linking different types of data that exist within the public sector. For example, linking information on incomes with tax data, benefits data, and employment data can be effective in reducing tax evasion and benefit fraud. Having information on the utilization of public programs by different segments of society, if possible, identified through civil registration information, will also assist in addressing social exclusion and inequality. The interaction of civil registration systems and information derived from program utilization will permit the improvement of both information systems.

Having highlighted the benefits of civil registration, it is also crucial to understand that CRVS is far from a panacea to solve all the problems of the public sector. It provides important information about the population but does not ensure that governments will use the data effectively and integrate it with other available information. Data collection can potentially address some policy problems. The capacity to address policy problems depends on the characteristics of registration programs mentioned above, especially on overcoming barriers to full and timely registration. Civil registration is inherently important for government and society, but the capacity to extend the utility of this program depends on the implementation of registration programs.

Implementing registration programs also involves making a number of important choices. Some of these are administrative. For example, the process can be expedited by reducing some of the complexity and the number of stages involved. Other policy choices involve considering the priority that civil registration will have for receiving scarce resources compared with other government programs. Even more difficult choices about personal privacy and the linkage of civil registration with other programs will have to be made if it is to reach its full potential.

If governments are to be successful in implementing more effective and timely civil registration systems, they must be willing to commit the resources to achieve that end. If they can develop those registration systems, they will have an important tool for improving the production and delivery of public services. They may also have a way to reduce future expenses for information collection, especially if the civil registration system is integrated with other data sources. The increasing availability of big data provides governments with the opportunity to integrate large quantities of information, of which civil registration is a crucial element, into more comprehensive pictures of their societies. While that may raise some privacy concerns, it can also open the way for improved services and increased equity for the population.

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Interviews (in person and by telephone)

Lic. Héctor Maldonado San Germain, Deputy Registrar, Federal District of Mexico

Ms. Norma Guaderejes, Civil Registry, Quito, Ecuador

Ms. Karen Bridgewater, Trinidad and Tobago

Ms. Cristina Tello, Transversal Projects, Office of Budget, Control and Management Evaluation, Government of Uruguay