



Asia-Pacific CRVS Research Forum

3–4 April 2023 | Bangkok, Thailand

Efficient delivery of social protection: Leveraging interoperability with CRVS systems

Monday 3 April 2023: Session 3.4

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Abstract

Countries around the world implement several Social Protection (SP) programs for their residents to address various situations. Determining the eligibility of potential beneficiaries necessitates information exchange across different social protection information systems and foundational platforms such as Civil Registration and Vital Statistics (CRVS), identification system, and payment system, as well as with systems from other sectors. However, these systems often operate in silos, making interoperability a challenge. To address this issue, the Digital Convergence Initiative (DCI) was launched in September 2021 under Universal Social Protection (USP2030) as a collaborative effort by USP2030 members, governments, development partners, civil society, and the private sector to develop integrated and interoperable social protection delivery systems. DCI aims to create consensus based global standards for promoting interoperability of SP information systems with other systems for effective and efficient delivery of social protection programs.



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To achieve the objective of interoperability, one of the workstreams of DCI studied the interoperability of SP systems with CRVS, considering that CRVS is a source of truth on various attributes that are important for decision making on beneficiary eligibility for SP programs. As SP programs serve people at various stages of life, from the womb to the grave, CRVS interoperability facilitates checks on birth, death, and marital life events, as well as family relationships, to determine eligibility for programs such as child grants, widow support programs, and old age allowance.

This paper presents the research work on the role of CRVS for social protection delivery and the value proposition of global standards that would make the SP systems and CRVS systems from different vendors interoperable by design.

Keywords: *CRVS, Social Protection, Interoperability, Integration, Standards, identification, identification documentation, Digital Convergence Initiative, USP2030, low and middle-income countries, OpenCRVS, HERA, DHIS2*

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Introduction

Social protection programs are utilized by the governments to prevent, manage, and overcome situations that adversely affect peoples' well-being. Particularly, these programs aim to assist excluded or marginalized individuals. However, inefficiencies, mismanagement, and corruption in the distribution of social protection benefits highlight the importance of legal identity and other documents for those who rely on them. The linkage between legal identity and social protection is a two-way relationship: without reliable identification, people cannot access social protection benefits, and the lack of access to social protection benefits reduces the incentives for individuals to register vital events such as birth, marriage, divorce, and death with the government.

A well-functioning Civil Registration and Vital Statistics (CRVS) system registers all births and deaths, issues birth and death certificates, and compiles and disseminates vital statistics, including cause of death information. It may also record marriages and divorces.¹

There is no globally agreed alternative to a properly functioning CRVS system. The United Nations defines CRVS as the "continuous, permanent, compulsory and universal recording of the occurrence and characteristics of vital events of the population in accordance with the law."² The data collected by CRVS systems can be very helpful to reach out to the most vulnerable and hard-to-reach individuals. The primary objective of CRVS is to provide legal documentation to individuals by certifying vital events, including their right to recognition as a person before the law and their formal relationship with the Government. These documents provide legal proof of vital event characteristics, which governments use to establish rights such as nationality, entitlements to services including social protection schemes, healthcare, education, national and voter identification systems, access to justice, property ownership, formal employment, financial services and inheritance. A birth certificate, for instance, provides proof of an individual's name, age, family links, and nationality; such documentation is crucial for obtaining key services like social assistance, healthcare and education.

However, in many countries, the contribution of CRVS in the delivery of social protection has been limited. In almost all low- and middle-income countries, the CRVS is significantly behind in providing information on vital events such as births, deaths, marriage, and divorce, to social protection delivery systems. For example, only 73% of the countries, territories and areas register at least 90% of births occurred. Furthermore, for death registration, only 68% of the countries, territories and areas have at least 90% coverage.³

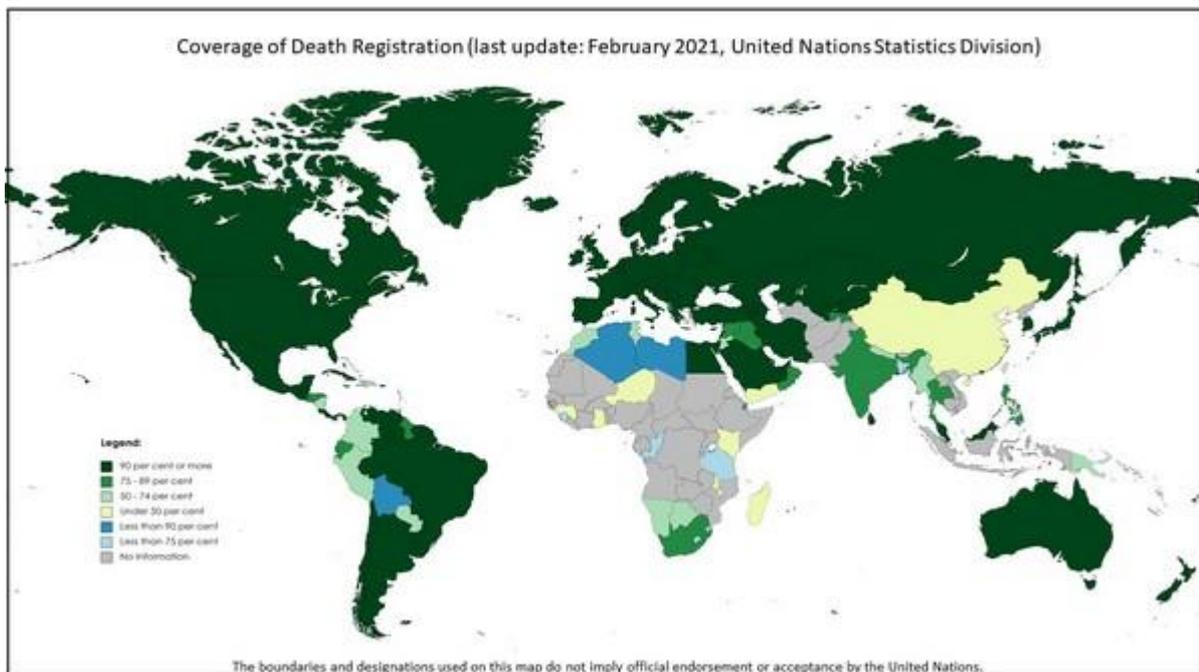
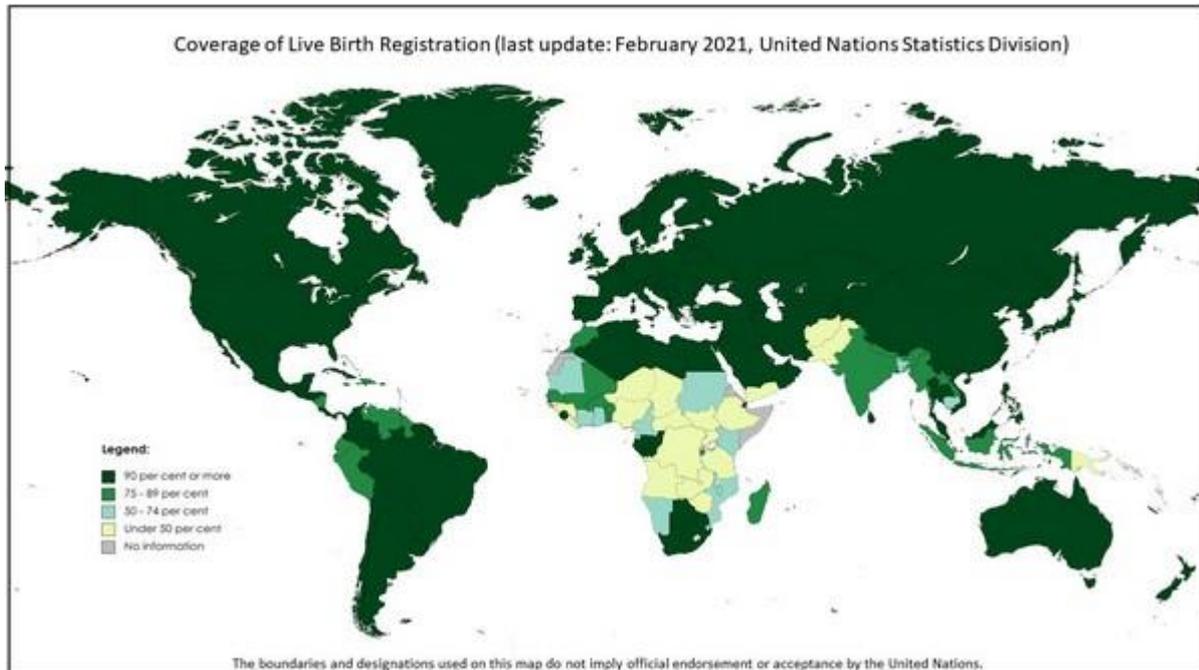
¹ [https://www.who.int/data/data-collection-tools/civil-registration-and-vital-statistics-\(crvs\)](https://www.who.int/data/data-collection-tools/civil-registration-and-vital-statistics-(crvs))

² CRVS Decade. <https://getinthepicture.org/crvs-decade/what-crvs>

³ <https://unstats.un.org/unsd/demographic-social/crvs/>

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Source : <https://unstats.un.org/unsd/demographic-social/crvs/>

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“Access to accurate and complete data about the age and family structure of populations in specific towns or villages, as well as the locations and causes of deaths as they happen, offers immediate value to governments during the times of crisis”, said Gloria Mathenge, social statistician at regional development organization [The Pacific Community](#) and current chair of the Global Civil Registration and Vital Statistics Group (source : [The case for data: How CRVS systems can help improve gender equity | Devex](#)⁴)

Digital social protection delivery systems typically involve interactions amongst the various program specific information systems as well as with shared foundational systems like the CRVS, Digital Identification system, and Payment system. To achieve interoperability, a social protection system should have common standards and protocols in place. While the health sector has interoperability architecture and standards, such as OpenHIE⁵ and FHIR standards⁶, no such standards exist for the social protection sector.

To address this felt need, Digital Convergence Initiative (DCI) was launched in September 2021 under Universal Social Protection⁷ (USP 2030), a global alliance of governmental and non-governmental organisations. DCI is a collaborative effort by USP2030 members, governments, development partners, civil society, and the private sector with the goal of building global consensus on open standards for integrated and interoperable social protection information systems.

The initiative encompasses several workstreams focused on developing open standards for interoperability, including one dedicated to examining the interoperability between CRVS and Social Protection (SP) systems.

The research work done for this workstream is presented in this paper.

Methodology

The research methodology involved the following phases.



DATA COLLECTION



DATA ANALYSIS



IDEATION AND
PROTOTYPE



WORKSHOPS FOR
VALIDATION



DOCUMENTATION
OF RESULTS

⁴ The case for data: How CRVS systems can help improve gender equity | Devex. 14 April 2020. <https://www.devex.com/news/sponsored/the-case-for-data-how-crvs-systems-can-help-improve-gender-equity-96927>

⁵ OpenHIE. <https://ohie.org/>

⁶ HL7 FHIR Release 4B. <https://www.hl7.org/fhir/>

⁷ USP2030: <https://usp2030.org/>

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Data Collection

- **Literature Review:** A desk research was conducted to understand the use of Civil Registration and Vital Statistics (CRVS) for Social Protection (SP) program delivery. The two reports *[The Nexus between Civil Registration and Social Protection Systems: Five Country Practices](#)*⁸ and *[Philippines' CRVS Legal Framework and Identity Management System](#)*⁹ enabled study of six country cases -Chile, Argentina, Namibia, Tunisia, South Korea and Philippines.
- **Talking Interoperability Dialogue Series:** DCI organizes a monthly dialogue series titled "Talking Interoperability"¹⁰ in which countries present and debate in depth on the architecture of SP systems interoperability with other systems such as CRVS, ID, and payment systems. These sessions from India, Belgium, Chile, Turkey, Cambodia, Brazil, France, Zambia, and Ghana provided an opportunity to understand how some countries have leveraged CRVS for SP program delivery, while other countries, who aspired to do the same but are encountering challenges in their efforts.
- **Study of Software solutions for CRVS:** Exploration of software solutions used by countries for the development of Digital CRVS/eCRVS enabled us to identify both open-source and proprietary software solutions. These solutions were studied to understand their interoperability capabilities for interacting with SP systems. OpenCRVS¹¹, HERA¹², Digitech¹³, DHIS2¹⁴, were some of the solutions studied through available documentation in public domain as well as discussions with the product team.
- **Expert Interviews:** Expert interviews with representatives from Chile, Turkey, India and OpenCRVS enabled better understanding of the use cases and interoperability mechanisms used in the country context. Interactions with colleagues from UNICEF and other CRVS and SP practitioners further enriched our understanding on the subject.

Data Analysis

We analysed information from various sources to create use cases for SP program delivery leveraging interoperability with CRVS. Study focused on how data from CRVS could aid in eligibility determination and automate decision-making to determine if a person is eligible to receive benefits or not. Additionally,

⁸ The Nexus Between Civil Registration and Social Protection Systems: Five Country Practices. International Development Research Centre, Ottawa, ON.

https://crvssystems.ca/sites/default/files/assets/files/SocialProtection_Compndium_e_WEB.pdf

⁹ Philippines' CRVS Legal Framework and Identity Management System. 2014.

<https://getinthepicture.org/resource/philippines-crvs-legal-framework-and-identity-management-system>

¹⁰ Talking Interoperability Dialogue Series: <https://webinars.socialprotection.org/category/series/talking-interoperability-dialogue-series/>

¹¹ OpenCRVS: <https://www.opencrvs.org/>

¹² HERA Civil Registration & Vital Statistics Solution: <https://www.wcc-group.com/id-security/products/hera-civil-registration-and-vital-statistics-solution/>

¹³ Digitech: <https://digitech-development.com/evelinframework/>

¹⁴ DHIS2: <https://dhis2.org/>

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we analysed the interoperability processes, data attributes, and application programming interfaces (APIs) for data exchange. We also studied the security and privacy aspects to ensure data protection while accessing personal data from the CRVS system. After analysing the data, we identified a list of priority SP schemes that seem to be widespread, leveraging interoperability between the CRVS and SP systems which included old age allowance, widow allowance, and child allowance programs.

Ideation and Prototype

We documented the business process flows of the identified use cases using sequence diagrams. Animated workflows were also created for the interactions between the CRVS system and SP system. OpenCRVS, an open-source software for CRVS systems, was deployed in the Amazon Web Services (AWS) Sandbox environment to implement these interactions with a demo SP application as a prototype.

Determining eligibility for the old age allowance program required verification of the age and liveness check of the beneficiaries in the CRVS system. These data attributes enabled automated decision-making and a seamless service delivery experience for those in need. Additionally, the workflow for the enrolment process of the Widow Allowance program was prototyped based on automated decision-making facilitated by fetching additional data attributes of the spouse from the CRVS system.

Workshops for Validation

The "Interoperability in Action" workshop¹⁵ was organized by DCI to demonstrate live the CRVS and SP systems interoperability. The workshop targeted country representatives from Turkey, Chile, and Bangladesh, as well as representatives from organizations such as the World Bank, ILO, UNICEF, ADB, PwC; digital public good organization such as OpenCRVS, and proprietary solution providers like HERA. The experts shared their experiences and feedback on the prototype and workflows. The event helped to create awareness on the benefits of interoperability between SP and CRVS systems. The outcome of the workshop highlighted that interoperability can further strengthen the social protection delivery system.

Documentation

Based on the work from preceding phases activities, the business process, data standards, and APIs were documented to create first drafts of standard documents for discussion and deliberation with experts through a mechanism of Standards Formulation Committee.

Findings

The case studies in the six countries studied for this paper concluded that the interoperability of social protection programs with CRVS can nudge people to update their data in CRVS in a timely manner, resulting in quick decisions on service delivery, as seen in the case of Chile. Mandatory birth registration was implemented for social protection in Chile, resulting in improvements for both the CRVS and social

¹⁵ Workshop recording: <https://sp-convergence.org/interoperability-in-action-1-crvs-workshop/>

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protection delivery. Other Latin American countries, including Argentina, Ecuador, Nicaragua, and Peru, modelled their social protection programs after Chile's and effectively implemented identity and identification requirements for enrolment in SP systems.

The case studies report concludes that birth registration in Latin America could not have increased so sharply in such a short time without the link to civil registration and identification and social protection programs. This had an important impact on poverty reduction. According to a World Bank evaluation of social protection programs, poverty rates would be 13 percent higher in Latin America in the absence of conditional cash transfer programs.¹⁶

The Namibia case demonstrated that interlinking civil registration and social protection can provide mutual benefits. In Namibia, civil registration is required to verify identification, manage entry to social protection databases, facilitate the placement of children in foster care and for adoption. Access to social protection systems creates a demand for civil registration and strengthens the demand for civil registration documents.

Analysing the business process workflows under the DCI work program of social protection programs including those from Chile, India, and Bangladesh and mapping it across the different actors using swim lane diagrams brings out the role of CRVS in business process workflow for the social protection program delivery. The use cases clearly demonstrated the importance of CRVS in providing eligibility information for social protection programs, enabling real-time decision-making.

While an effective civil registration and vital statistics (CRVS) system is critical for planning and monitoring programs across several sectors, still over 110 low-and middle-income countries have deficient CRVS systems¹⁷.

Significant investments are being made to improve the status of CRVS systems. The Global Plan for Scaling-up Civil Registration and Vital Statistics¹⁸ covers activities over a 10-year period from 2015 to 2024, with the goal of universal civil registration of births, deaths, marriages, and other vital events, including reporting cause of death, and access to legal proof of registration for all individuals by 2030.

¹⁶ *Conditional Cash Transfers: Reducing Present and Future Poverty*. World Bank Policy Research Report. Washington, DC: World Bank. © World Bank. <https://openknowledge.worldbank.org/handle/10986/2597>

¹⁷ [Global Civil Registration and Vital Statistics \(worldbank.org\)](https://www.worldbank.org/)

¹⁸ [Abstract: Global Civil Registration and Vital Statistics-Scaling up Investment Plan 2015-2024 \(worldbank.org\)](https://www.worldbank.org/)

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Targets	2020	2025	2030
Births in given year are registered	80%	90%	100%
Children whose births are registered have been issued certificates	70%	85%	90%
Deaths in given year reported, registered, and certified with key characteristics	60%	70%	80%
Maternal and newborn deaths reported, registered, and investigated	80%	90%	100%
Deaths in children under 5 reported, disaggregated by age and sex	60%	70%	80%
Cause of deaths in hospitals reliably determined and officially certified	80%	90%	100%
Countries have community assessments of probable cause of death determined by verbal autopsies using international standards	50%	65%	80%

Source : <https://www.worldbank.org/content/dam/Worldbank/document/HDN/Health/CRVS%20Scaling-up%20plan%20final%205-28-14web.pdf>

The study of software solutions for digital CRVS and comparison of the available interfaces with those required for the use cases revealed that there are still gaps in the need for interoperability interfaces for SP program delivery. Some of these products have interfaces to integrate with Identification systems or for notification of events by health systems for registration of events but they are not designed based on standards to enable interoperability with SP systems.

Various other initiatives/agencies are focusing on the role of interoperability for social protection program delivery. ID4Africa hosted a live cast on [Digital Identity in the Service of Social Protection](#) in March 2023, OpenCRVS has kicked off an interoperability hackathon in March 2023 to demonstrate use case of CRVS for various sectors, DCI and G2Pconnect are looking at integration specifications of CRVS with SP systems for service delivery.

Discussion

Based on the country case studies and use case analysis it is evident that integrating social protection program information systems with digital CRVS systems has numerous benefits. Firstly, it can help governments ensure that their social protection programs reach their intended beneficiaries by establishing more accurate and up-to-date information on individuals by fetching the data from CRVS system. This can prevent fraud and ensure that program benefits reach those in need. Secondly, integration can reduce administrative burdens and streamline program delivery by automating registration and verification processes. Lastly, it can improve evidence-based decision making by providing governments with standardized data repositories and APIs that can be used to inform policy decisions and track progress towards development goals. Overall, integration of social protection programs and CRVS systems has the potential to improve the lives of vulnerable populations and promote sustainable development.

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CRVS systems provide legal identity, and they also serve as authoritative sources of truth for various attributes needed for access to government services such as (i) access to education, health, age-based cash transfer, and other government social services; (ii) access to formal employment and benefits, for example, death and disability insurance as well as health insurance; and (iii) the right to claim inheritance, among others¹⁹.

The access to social protection services serves as an incentive to register vital events in CRVS system. The richness of the vital statistics is beneficial for both private sector and public sector. Social protection sector policies and programs can leverage the statistics in shaping the program design.

To realize the benefits and synergies of interoperability, well-functioning digital CRVS system and SP information systems are prerequisites. The CRVS system should be inclusive and with high coverage of the vital events to enable the SP systems to leverage the data for decision making in program delivery. The CRVS system and SP systems should ensure that both the systems are interoperable by design by adopting open standards which enable interoperability and avoid vendor lock in.

Countries are increasingly looking at open-source software for foundational systems like identification and CRVS in developing countries. One of the primary benefits is that it is often less expensive than proprietary software. Additionally, open-source software can be customized by anyone without any dependence on a particular vendor and thus prevents vendor lock in and provides strategic control over the software to the government.

However, there are also some challenges to address, e.g., availability of skilled resources and vendor ecosystem to support implementation and maintenance of the open-source software in developing countries.

Furthermore, to fully facilitate the power of open-source solutions by letting the different components talk to each other, standards would be required as a common language. Unlike the health domain which has standards defined, there are currently no open standards for the social protection sector. Hence, the work of the DCI would support in addressing this gap and unleashing this power.

Additionally, by creating standards in an open and transparent manner which are based on the consensus of relevant stakeholders, the probability of uptake of standards by solution providers (open source and proprietary software providers) of both CRVS and SP systems increases.

This, consequently, enables interoperability by design.

¹⁹ [An introduction to the civil registration and vital statistics systems with applications in low- and middle-income countries | Journal of Health, Population and Nutrition | Full Text \(biomedcentral.com\)](#)

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Conclusion

Quite a few low- and middle-income countries have deficient CRVS systems. Countries and multilateral organizations are working on strengthening their CRVS systems as they realize the need and potential of these systems for legal identity, administrative functions as well as statistical function.

While there are quite a few software products for setting up digital CRVS system comprising of both open-source software and proprietary products, the implementation of open standards for enabling interoperability of CRVS with social protection systems needs further work. The development and consensus building on these open standards (digital public goods) under the Digital Convergence Initiative would help interoperability of CRVS with social protection systems. Adoption of standards by both the CRVS software solutions and the social protection software solutions, would enable interoperability by design. This would allow for easy integration of various vendor solutions that adhere to globally accepted standards through a plug-and-play approach. Integrated and interoperable systems enable people to access services without having to present physical documents and decisions can be made in real time enabling a seamless service delivery experience, particularly the poor and the vulnerable people seeking social protection. However, the implementation of the interoperability standards in a country can vary widely depending on several factors, such as the availability and coverage of the digital systems, internet connectivity, digital literacy and the political will and enabling legal environment.

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