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Project Min(民)Sa : Ansan

"Migrant Identity Number Sandbox for reclaiming rights and recognition"

Addressing Challenges in International Migration

Reclaiming Rights and Recognition through a Digital Gateway for Undocumented Migrant Children in South Korea

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THE GENEVA CHALLENGE 2025



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Project Min(民)Sa: Ansan

Reclaiming Rights and Recognition through a Digital Gateway for Undocumented Migrant Children in South Korea

ABSTRACT

Undocumented migrant children in South Korea, particularly in cities like Ansan, face systemic exclusion from education, healthcare, and legal recognition due to their lack of official status. Despite international legal commitments, South Korea's fragmented policy landscape leaves this population in a state of civic anonymity, perpetuating intergenerational marginalization. The Min(民)Sa Project addresses this critical gap through an innovative civic-tech solution: a pseudonymous identity and service coordination platform grounded in Zero-Knowledge Proof (ZKP) technology. By enabling undocumented children to access essential services without disclosing their legal status, MinSa balances anonymity and accountability offering a secure, rights-based alternative to formal documentation. This pilot initiative not only bridges immediate service gaps but also creates a scalable model for inclusive governance, transforming how undocumented children are recognized, protected, and integrated into society. MinSa thus advances child welfare, strengthens social cohesion, and contributes to long-term structural reform in Korea's highly status-dependent public service infrastructure. The project aims to reach other countries facing similar issues and ultimately work towards the 2030 SDGs goals in 'leaving no one behind'.

Keywords: Undocumented migrant children, civic identity, Zero-Knowledge Proof, inclusive governance, service access

* Artificial Intelligence (AI) was used for this project to generate images (icons within the sample websites, illustrated narratives, etc.) and to improve the project's language and structure.



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1. Problem Statement

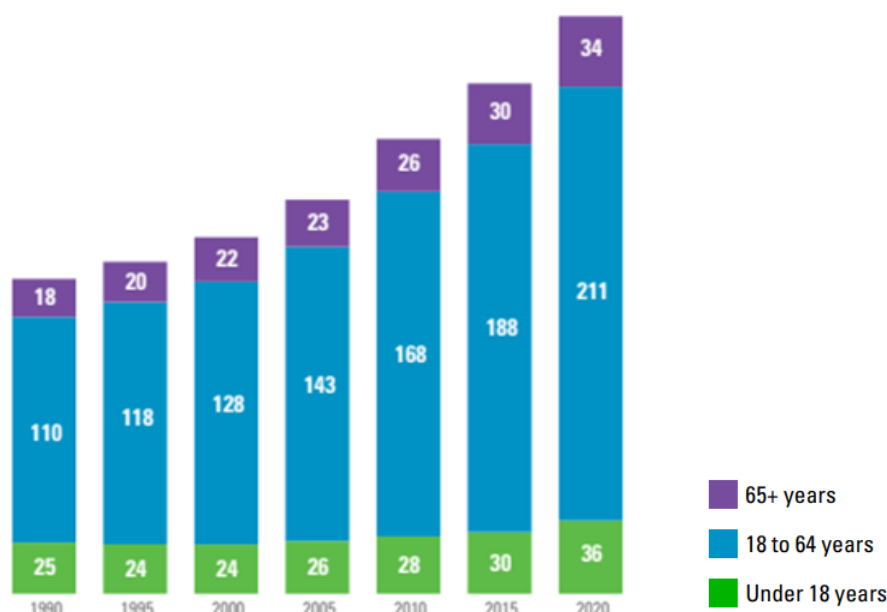
1.1 The Influx of Foreign Workers and the Rise of Undocumented Immigrant Children in Korea

Undocumented migrant children have been increasing globally alongside the expansion of international migration. They are not a temporary or incidental presence but a structural outcome of migration systems, especially where legal and policy gaps leave families without protection. Most commonly, they are born to parents who have overstayed their visas, been denied asylum, or lack legal status themselves, thereby inheriting undocumented conditions from birth.

Undocumented migrant children are a demographic group that has been rapidly gaining recognition in migration scholarship and governance, following broader trends in how migration is now closely tied to rights-based access to legal identity, education, and healthcare. Migration has long been a feature of human history, but today it is not just about crossing borders; it is about accessing and reproducing rights across generations. In 2020, an estimated 281 million people, or 3.6% of the global population, were international migrants (UN DESA, 2021). By mid-2024, the number of forcibly displaced persons had reached 122.6 million (IOM, 2024).

Children have become increasingly central in this global migration landscape. They are no longer merely passive dependents accompanying adult migrants but now represent a distinct and expanding demographic. From 1990 to 2020, the number of international child migrants under the age of 18 grew from approximately 25 million to 36 million, reflecting an increase of about 50 percent (UNICEF, 2023). This trend highlights the fact that migration has evolved into a structural, intergenerational phenomenon.

Figure 1. Number of International Migrants by Age, 1990–2020 (in millions)



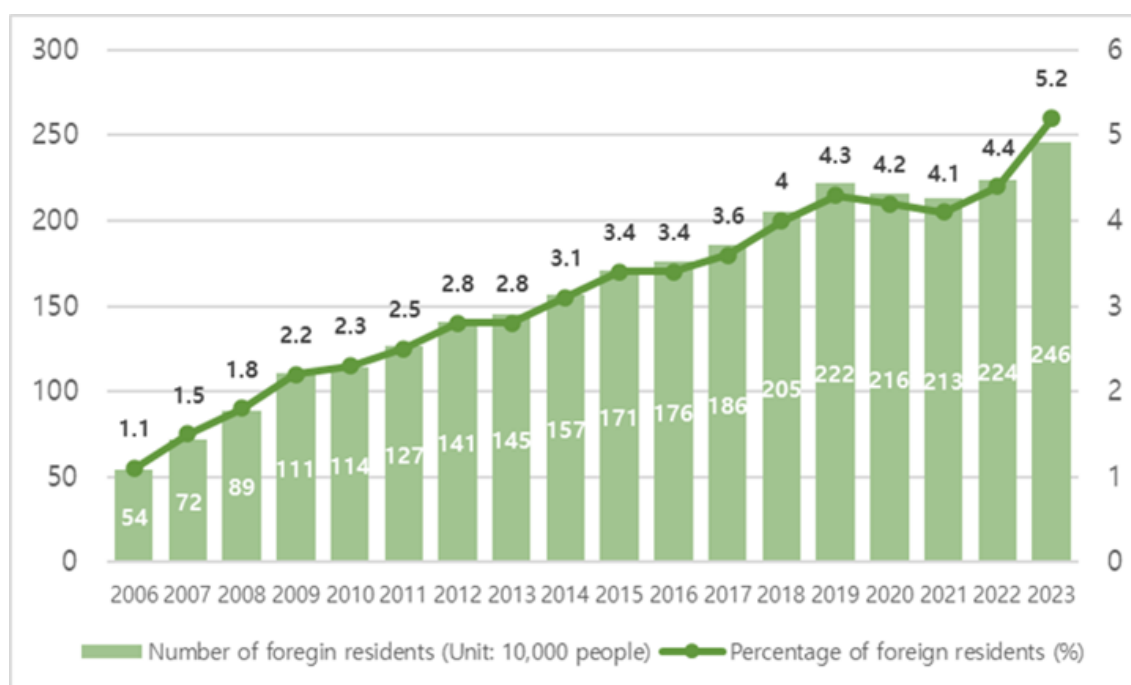
Source: UNICEF. (2023).



Despite this growing presence, undocumented migrant children remain relatively marginalized in policy discussions. They lack tailored policy responses that address their unique status at the intersection of migration, youth, and legal invisibility. In particular, children without legal protection are at a heightened risk of exclusion from essential services such as education, healthcare, and legal identity, reinforcing cycles of vulnerability and inequality.

In South Korea, the number of foreign residents reached approximately 2.45 million by 2023, accounting for 5.2 percent of the total population. This increase reflects broader labor migration trends in East Asia. Although multiculturalism is often emphasized in policy rhetoric, access to public services remains heavily dependent on legal status. South Korea maintains one of the most restrictive immigration systems in the region.

Figure 2. Growing Number of Foreign Residents in South Korea



Source: Ministry of the Interior and Safety. (2023).

This demographic change increasingly involves not just adult migrant workers but also children growing up in South Korean society without legal identity. These undocumented children are often treated as legally invisible and are particularly vulnerable to exclusion. Their presence demonstrates that migration is no longer solely about mobility but also about the reproduction of inequality across generations. As such, policy responses must move beyond short-term remedies and toward structural, rights-based inclusion.

1.2 Undocumented Immigrant Children and the Policy Vacuum (Korea)

Since 1954, the international community has worked to establish a robust legal framework to protect migrant and undocumented children. The United Nations has played a central role in developing and ratifying key international human rights instruments that affirm every child's right to identity,



education, health, and protection regardless of legal or migratory status. These include the 1954 Convention Relating to the Status of Stateless Persons, the 1989 UN Convention on the Rights of the Child (UNCRC), and the 1990 International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families. These frameworks reflect a growing global consensus that children on the move must not be left behind.

Table 1. Relevant International Legal Instruments on the Rights of Undocumented Migrant Children

Instrument	Article / Provision	Relevant Content
Convention Relating to the Status of Stateless Persons (1954)	Article 22	Stateless persons shall enjoy the same treatment as nationals in respect to elementary education.
UN Convention on the Rights of the Child (1989)	Article 2	The Convention applies to every child without discrimination of any kind.
	Article 7	Every child has the right to birth registration, a name, and nationality.
	Article 24	Every child has the right to the highest attainable standard of health and access to healthcare services.
	Article 28	Every child has the right to education; primary education must be compulsory and free to all.
International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families (1990)	Article 30	Every child of a migrant worker has the right to education, irrespective of migration or residence status.

Source: United Nations, 1954; United Nations, 1989; United Nations, 1990

South Korea has ratified several of these key treaties, including the UNCRC and the 1954 Stateless Persons Convention, thereby committing to uphold the fundamental rights of all children within its territory. However, it has not ratified the 1990 Convention on Migrant Workers, which limits the country's legal obligations toward the children of undocumented migrants. This partial adoption of the global normative framework contributes to the existing gap between Korea's international commitments and their domestic implementation.

Despite formal commitments, undocumented children in Korea face a persistent policy vacuum across legal, educational, and health sectors. Although a 2012 Ministry of Education directive allows them to enroll in public schools, implementation varies significantly across municipalities. Many children are not issued academic records or graduation certificates. They are excluded from the national health insurance system and denied civil registration, preventing access to vaccinations and other basic services. The 2021 Temporary Stay Permit Policy, recently extended to 2028, offers some relief but still fails to provide legal identity or guaranteed access to essential services.

This gap is especially pronounced in Ansan City, Gyeonggi Province, which has long served as a hub for migrant labor in Korea. As of 2024, over 15% of Ansan's population were foreign nationals, the highest in the country. Despite this predictable concentration of migrant families, not even an official statistic exists on the number of undocumented migrant children in the city. According to civil society and media reports, approximately 20,000 undocumented migrant children are estimated to be living in



Korea, ¹but they remain legally uncounted and politically invisible.

In Ansan, where a wide range of languages are spoken, the integration of migrant communities has become increasingly difficult, further complicating access to services for undocumented children. This linguistic and cultural fragmentation highlights the urgent need for more inclusive and coordinated policy responses.

Table 2. Top 5 Korean Cities/Counties with the Largest Registered Foreign Resident Population (as of November 2023)

Rank	City/County (Si/Gun/Gu)	Number of Registered Foreigners
1	Ansan-si, Gyeonggi-do	108,033
2	Hwaseong-si, Gyeonggi-do	76,711
3	Siheung-si, Gyeonggi-do	74,653
4	Suwon-si, Gyeonggi-do	71,392
5	Bucheon-si, Gyeonggi-do	58,632

Source: Ministry of the Interior and Safety. (2023).

Table 3. Top 5 Foreign Nationalities by Share in Ansan City (as of May 2025)

Rank	Nationality	Population	Share (%)
1	Korean Chinese / Chinese	61,976	61.59
2	Uzbekistan	10,049	9.9
3	Korean Russian	7,418	7.37
4	Kazakhstan	3,696	3.67
5	Vietnamese	2,528	2.51

Source: Ansan City Government. (2025).

In the absence of a national framework, various NGOs, faith-based organizations, and local institutions in Ansan have attempted to fill the void by offering support in legal, educational, and health services. However, these efforts remain fragmented and lack systemic coordination, making it difficult to deliver consistent and holistic support for undocumented migrant children. Each organization operates within its own mandate, resulting in overlapping responsibilities, service gaps, and inefficiencies. Without a unified system, this patchwork of interventions cannot adequately address the interconnected challenges undocumented children face.

¹ Mirae Hankook Ilbo. (2023, July 24). *Undocumented migrant children: 20,000 without access to schools or hospitals*. Future Chosun. <https://futurechosun.com/archives/117118>



Table 4. Ansan-Based Support Organizations for Undocumented Migrants

Legal aspects	Education	Health
1. Ansan Foreign Resident Counseling Support Center 2. Ansan Migrant Center 3. Ansan Multicultural Family Support Center 4. Gyeonggi Foreigners' Human Rights Center 5. Gyeonggi Southern Migrant Women's Human Rights Center	1. Ansan Global Youth Center 2. Ansan Jeil Church Migrant Center 3. Ansan Multicultural Education Center 4. Ansan Multicultural Small Library 5. Ansan Rainbow Youth Center 6. Ansan Youth Counseling and Welfare Center 7. Dongsan Church Migrant Center	1. Ansan City Hospital Multicultural Clinic 2. Ansan Public Health Center Foreigners' Medical Team 3. Friends of Hope 4. Galilee Medical Welfare Cooperative 5. Korean Red Cross Ansan Branch 6. Saenal Medical Welfare Cooperative

Source: Author's compilation from various sources

Undocumented migrant children in Korea remain in the blind spots of governance. Their exclusion from legal identity becomes the root cause of further marginalization in education and healthcare. Although Korea is bound by international human rights law, it lacks an integrated system to uphold those rights for undocumented children. The current network of non-state interventions, while valuable, is insufficient to address the structural and intergenerational exclusion they experience.

To address this gap, the project proposes MinSa (Migrant Identity Number Sandbox), a decentralized civic identity and service coordination platform designed to ensure that undocumented children can access essential services such as education, healthcare, and legal aid without the risk of legal exposure. Specifically, MinSa tackles the problem of anonymity by providing each child with a pseudonymous identity code that can be used to safely register for school, medical treatment, and social support systems. At the same time, it responds to the policy vacuum by creating a parallel yet accountable system for service delivery in the absence of formal legal recognition.

MinSa is rooted in the Confucian and democratic notion of 'Min (민, 民)', a term that historically represents the 'common people' not as subjects to be governed, but as central constituents of governance and society. By invoking this principle, the platform redefines undocumented migrant children not as invisible or marginal, but as individuals entitled to care, dignity, and participation.

More than just a digital tool, MinSa holds significant transformative potential. It can serve as a foundational mechanism for structural change in Korea's highly status-based welfare infrastructure. Through pilot implementation at the local level, such as in Ansan where foreign residents account for over 15% of the population, MinSa could demonstrate a scalable model for inclusive governance and ultimately pave the way for a national policy shift rooted in human rights, equity, and social integration.



2. Literature Review

2.1. “Undocumented Migrant Children”

While the term is still ambiguous, most previous literature refers to “undocumented migrant children” as individuals under the age of 18 residing in a country without legal authorization (Lee and Park, 2024). This may be due to overstayed visas, denied asylum applications, or being born to undocumented parents. Lee and Park (2024) lists out specific circumstances in which children may face this situation: 1) when a parent who cannot be identified from their home country fails to register their child's birth due to concerns about their status of residence, 2) if the parents entered the country illegally, or their legal status of residence has expired, 3) if the children entered the country alone and did not register after the expiration of the stay date, 4) if the children from married immigrant families are not registered from birth or after the expiration of their stay. Anna Lundberg (2020) highlights that while the term “illegal” is often used in policy discourse, it is ethically and legally problematic as it criminalizes the child’s existence. Instead, “undocumented” is preferred to recognize legal status without dehumanization. Lundberg also notes that international legal frameworks, particularly the UN Convention on the Rights of the Child (CRC), affirm that all children, regardless of immigration status, are entitled to fundamental rights, including access to healthcare, education, and protection from harm.

Despite this, undocumented children live in conditions shaped by “deportability” (Lundberg, 2020; Lind, 2020), where the threat of being forcibly removed pervades everyday life. This results in psychological stress, identity confusion, and restricted access to basic services. While there aren’t many studies delving deeper into the status or situation of undocumented migrant children globally, scholars in the U.S. and UK document how the children face systemic barriers in higher education, employment, and social participation. Lind (2020) explores how undocumented migrant children in Sweden and the UK navigate state exclusion, noting their simultaneous framing as both “vulnerable innocents” and “illegal subjects.” These studies demonstrate how the structural exclusion of undocumented migrant children affect both their social status and their personal identity.

2.2. Undocumented Migrant Children in Korea

In the Korean case, the emergence and increase of undocumented migrant children lies on the expansion of migrant workers and marriage migrant women. In Korea, migrant workers are obliged under the Employment Permit System to renew their contact with the employers every year and can maintain their employment status for five years (Lee et al., 2013). However, this system is strictly regulated, causing them to be often violated by ‘immigrant workers’ whose children end up as undocumented migrant children. In the case of the children of marriage migrant women, marriage migrant women are able to apply for their legal status after 2 years of residence, meaning it usually takes them around four years to have their citizenship status in Korea. The complicated process leads to an increase in the number of children who are born without a legal basis of their identity. Undocumented migrant children in Korea face particular difficulties because the Korean legal system ties most rights to citizenship or legal residency. Kim (2019) critiques Korea’s limited implementation of the UN CRC, arguing that undocumented children are systematically excluded from social services due to their lack of legal identity.

2.2.1. Identity

Undocumented migrant children often experience a unique form of identity disruption shaped



by their legal status and cultural displacement. As Benuto et al. (2018) highlight, these children are frequently caught in a state of *liminality*: belonging fully to neither their parents' culture of origin nor the host society. This in-between status creates persistent feelings of alienation, exclusion, and identity confusion. The absence of legal recognition not only limits access to material resources but also prevents the formation of a coherent social self, as these children struggle to reconcile their undocumented status with the cultural values and expectations of the society in which they grow up.

This psychological liminality is further exacerbated by the experience of being “cultural brokers” for their families, navigating adult responsibilities such as translation and institutional mediation while lacking full membership in either cultural sphere. Many undocumented youths describe shifting constantly between languages and identities: feeling like outsiders both at home and in school. Such dissonance undermines their ability to form a stable and positive self-concept, and often results in internalized stigma, low self-esteem, and reduced aspirations. Ultimately, undocumented legal status operates not only as a legal boundary but also as a psychosocial barrier to healthy identity development.

2.2.2. Social Service

Legal Service

Legal status, as a foundation of identity and citizenship, affects the individual not just as a structural basis of their life but also as their pathway in access to basic services. In South Korea, undocumented migrant children face multilayered legal exclusion beginning at birth. Without access to official birth registration or a resident identification number, they are not recognized as legal subjects within the national administrative system. This absence of legal identity prevents them from enrolling in schools, accessing healthcare, or receiving public benefits- rights that are otherwise guaranteed under domestic laws such as the Child Welfare Act. Although some administrative guidelines have attempted to include them temporarily in areas like education (explained further below), these measures remain conditional and incomplete. The legal system continues to treat undocumented children not as independent rights-holders but as appendages to their parents' immigration status, rendering them structurally invisible within the framework of citizenship and state protection. This form of exclusion is not merely a legal technicality, but a fundamental denial of personhood and rights.

Education

In South Korea, access to education for undocumented migrant children has been achieved not through legal reform, but through years of advocacy and civil society pressure. Since 2006, the Ministry of Education has implemented administrative guidelines allowing undocumented children to attend elementary and middle schools without an alien registration number. These measures emerged in response to public backlash against immigration enforcement targeting children and were intended to prevent the disruption of education for long-term residents. Over time, access was expanded to high school, and in some cases, the Ministry of Justice granted temporary stay permits to students who completed a certain number of years in the public education system².

However, these policies remain temporary. While students may be permitted to complete high school, they remain excluded from higher education or scholarship programs due to their lack of legal identification. The absence of a resident or alien registration number continues to function as a barrier,

² Kim, Kyungha, & Chae, Yebin. (2025, March 16). [Twenty years of temporary policies for undocumented migrant children: Still insecure basic rights](#). The Better Future (더 나은 미래).



not only to education but also to legal recognition and long-term integration. As such, the state's educational inclusion acts more as a provisional concession than a structural right.

This uncertain legal status creates ongoing psychological and social harm. Undocumented students often live in fear of exposure, suppressing their identities in school settings and avoiding institutional contact. This fosters a pervasive sense of invisibility, self-censorship, and diminished future orientation. Education, rather than serving as a path to inclusion, becomes a site where conditional belonging is temporarily allowed but ultimately withdrawn. The result is a generation of youth who are educated within society yet denied the means to fully participate in it.

Health

Kwon (2011) analyzes the healthcare access of undocumented children in Korea through a legal lens, highlighting the structural barriers that prevent them from receiving even basic medical care. While international human rights law, particularly the CRC and ICESCR, guarantees the right to health for all children, Korean domestic law conditions healthcare access on legal residency. As a result, undocumented children are ineligible for National Health Insurance and often avoid hospitals altogether due to fear of immigration detection. Kwon's research reveals that many parents are reluctant to seek medical attention even in emergencies, and this is further complicated by the lack of birth registration, which makes it impossible to obtain identification required for accessing public services. Although some local governments and NGOs provide ad hoc, charity-based care, such support is neither reliable nor universally accessible. Kwon contends that the legal exclusion of undocumented children from healthcare systems violates Korea's obligations under international law and calls for legislative reform to guarantee healthcare as a basic right, independent of immigration status.

2.2.3. Life Transition

In South Korea, undocumented migrant children may experience a degree of institutional inclusion during their school years, especially under policies that allow access to compulsory education. However, this inclusion abruptly dissolves upon their transition to adulthood. Turning 18 marks a fundamental legal and existential shift, not simply a chronological milestone, but a sudden ejection from conditional belonging to full exclusion. For undocumented youth, adulthood does not signify social maturity but rather a forced entry into illegality, often accompanied by psychological distress, identity disruption, and a breakdown of future prospects (Lee & Beejinkhuu, Uurtsaikh, 2025).

This transition aligns with Gonzales' (2011) concept of "learning to be illegal," where undocumented youth - previously in a state of "suspended illegality" - must now internalize strategies of self-regulation, avoidance, and concealment in response to legal precarity. As they lose access to education, employment pathways, and state services, many face permanent marginalization and downward mobility. The result is not only a delayed or denied social adulthood, but what scholars have called "permanent temporariness": a state in which one is physically present in society, but legally and socially erased.

2.3. Previous Cases

While national-level legal and policy frameworks in South Korea remain insufficient in addressing the rights and needs of undocumented migrant children, certain municipalities and emergency public health systems have made efforts to mitigate this institutional neglect. These localized and temporary initiatives offer insight into how state and non-state actors can construct alternative mechanisms of recognition and access in the absence of formal legal status. This section examines two



such cases: a municipal-level identification certificate introduced by Siheung City, and the temporary foreigner management number system implemented during the COVID-19 pandemic. Together, these examples reveal both the possibilities and limitations of non-national governance in responding to the legal invisibility of undocumented migrant children.

Siheung City, South Korea: ‘Siheung Child Confirmation Certificate’ (경기도 시흥시 ‘시흥아동확인증’)

In 2023, Siheung City launched a pioneering initiative by issuing the Siheung Child Confirmation Certificate to children born in Korea to undocumented foreign parents who are ineligible for official birth registration. This was formalized through the “Ordinance on the Identification and Support of Unregistered Children Born in Siheung” passed in August 2023. By collaborating with hospitals, childcare centers, and welfare offices, the city identified ten eligible children and issued certificates to seven by the end of that year³.

Although the certificate does not constitute legal birth registration, it grants access to essential services: most notably, 18 types of state-mandated vaccinations via temporary identification numbers in the national disease control system. In addition, children from multicultural families may receive certain welfare benefits such as child allowances, parental support, and postpartum care subsidies. This case demonstrates how a local government, even without national legal backing, sought to partially address the legal and social precarity faced by undocumented children. Siheung’s initiative offers a symbolic and functional form of recognition, highlighting the role municipalities can play in extending partial rights to legally invisible populations.

Temporary foreigner management number system during the COVID-19 Pandemic (코로나19 시기 외국인 임시 관리번호 시스템)

In January 2022, amid increasing public criticism and health concerns, the Korea Disease Control and Prevention Agency (KDCA) implemented a temporary policy allowing undocumented migrants to receive vaccinations by obtaining a foreigner management number from local health centers⁴. This emergency measure was intended to restore vaccination access to undocumented populations, especially children, after services had been suspended during the height of the pandemic.

Before COVID-19, undocumented individuals could access vaccinations by paying partial fees. However, the pandemic led to a dramatic service halt: as of November 2021, only 149 out of 258 public health centers continued vaccinating children, with none operating in Seoul or Incheon. In Seoul alone, the number of undocumented children receiving vaccinations dropped from 3,652 in 2019 to just 275 in the first half of 2021. Public pressure mounted after Physicians for Human Rights Korea filed a complaint to the National Human Rights Commission, prompting authorities to act. This case illustrates how crisis scenarios can exacerbate structural exclusion for undocumented populations, but also how emergency governance can serve as a critical entry point for addressing gaps in legal protection. The rapid implementation of the temporary ID system underscores the importance of legal registration mechanisms as a prerequisite for basic health rights.

³ PapayaStory, “Siheung City, Providing Various Services After Registering Undocumented Migrant Children” 2024.01.17.

⁴ Lee, Jaeho. (2022, January 20). [COVID-19 interrupts essential vaccinations for undocumented migrant children - services resume after two years](#). The Hankyoreh.



2.4. ZKP: The Goldilocks Zone Between Anonymity and Accountability

As the previous cases illustrate, local and emergency responses in South Korea have attempted to compensate for national policy gaps concerning undocumented migrant children. Yet both cases reveal structural limitations. In Siheung, the number of children reached through the Child Confirmation Certificate remained low despite the program's ambition. During the COVID-19 pandemic, access to vaccinations for undocumented children sharply declined, especially in metropolitan areas, until emergency ID numbers were introduced. These examples underscore a deeper structural tension: even when services are made available, fear of exposure and the absence of secure identification mechanisms prevent effective uptake.

At the core of this problem lies a fundamental governance paradox: how can a system recognize individuals who, for their own safety, must remain invisible? For undocumented children and their families, anonymity is often a matter of survival. Exposure to any official registry (however well-meaning) can trigger consequences, including detention or deportation. Thus, civic systems must be designed with anonymity not as a loophole, but as a precondition for access. At the same time, public administrations cannot serve entirely invisible populations. Verifiability remains essential for ensuring efficient resource allocation, tracking service provision, and safeguarding public trust. Without a means to confirm eligibility, social programs risk being either underutilized or misused. This tension - between the need to protect identity and the need to confirm it- is one of the central challenges in designing inclusive systems for legally excluded populations.

This is where Zero-Knowledge Proof (ZKP) offers a potential breakthrough. As a cryptographic algorithm, ZKP enables the verification of a claim (such as a child's school attendance or vaccination status) without revealing any personal or identifying information. Much like a digital handshake, ZKP confirms that the conditions for access are met while preserving complete anonymity. It allows civic systems to operate within a "Goldilocks zone" between anonymity and accountability, where just enough is revealed to function, but never enough to threaten.

ZKP has already been discussed in sensitive civic infrastructures. For instance, the European Parliament in 2024 has discussed integrating different privacy-preserving technologies such as ZKP into the European Digital Identity Wallet to prove within the Member States the attributes, personhood, attestations, etc. of an individual⁵. In our case, we explore the possibility of applying ZKP experimentally, starting not with national systems, but with local or NGO-based platforms that serve undocumented communities. Through this approach, we seek not only to address an engineering problem, but to reimagine what civic inclusion can look like in contexts of legal erasure.

⁵ European Digital Identity Cooperation Group, [Discussion Paper G - Zero Knowledge Proof](#), Version 1.4, updated 30 March 2025

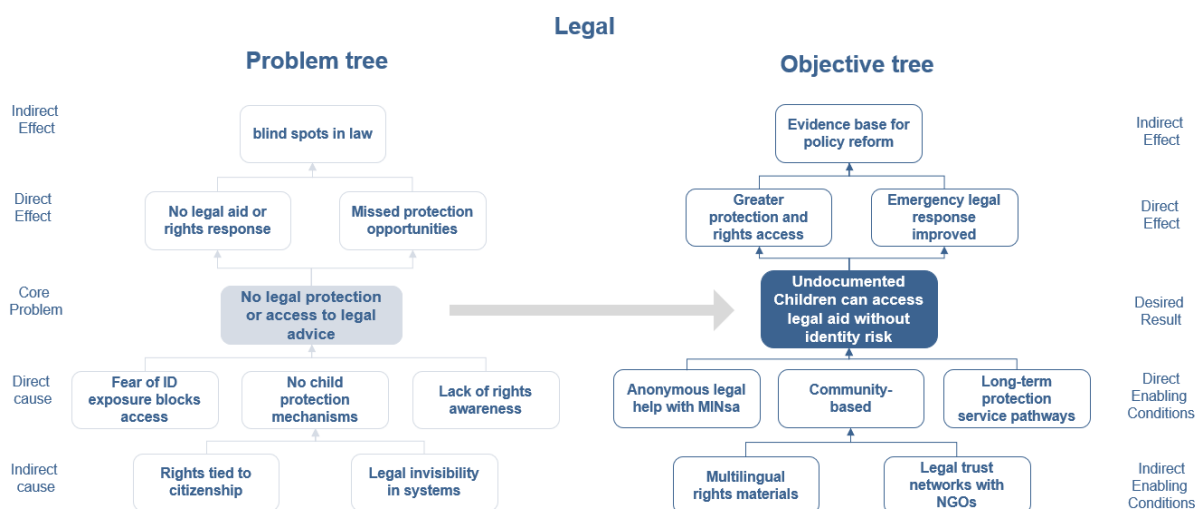


3. Project Rationale: Problem Tree & Objective Tree

3.1. Legal

Without legal identity, undocumented children cannot access legal aid or protection services. Fear of exposure prevents families from seeking help. MinSa enables anonymous legal support, community-based abuse monitoring, and multilingual rights education through trusted NGOs, promoting justice and informing future child protection policies.

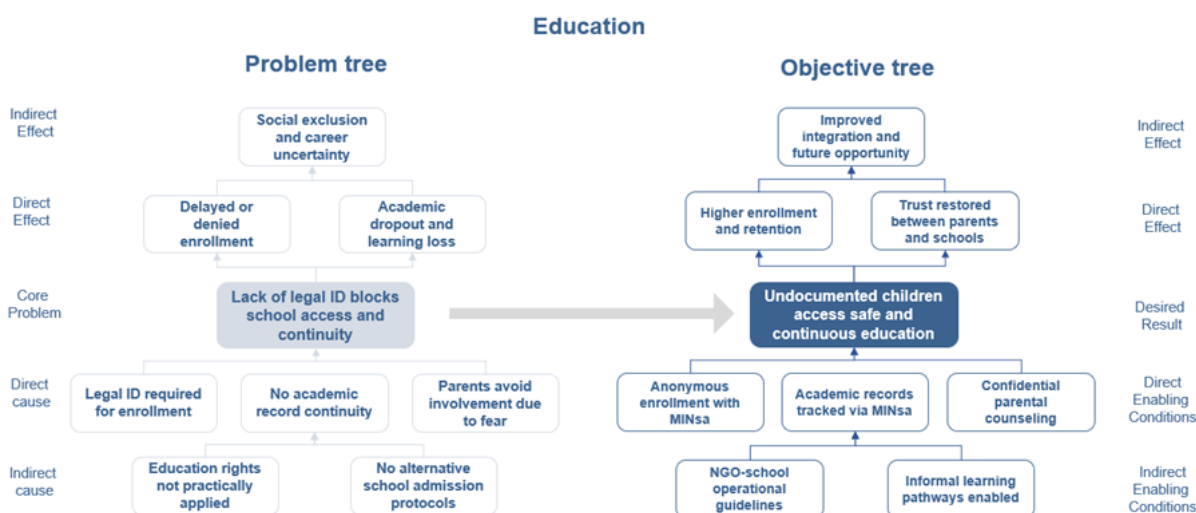
Figure 3. Problem and Objective Tree: Legal



3.2. Education

Lack of legal ID blocks school enrollment and record keeping. Parents often avoid schools out of fear, leading to delayed entry, dropout, and isolation. MinSa supports anonymous school enrollment, secure record management, and confidential parental guidance. NGO-school guidelines and informal learning pathways can boost access and trust.

Figure 4. Problem and Objective Tree: Education

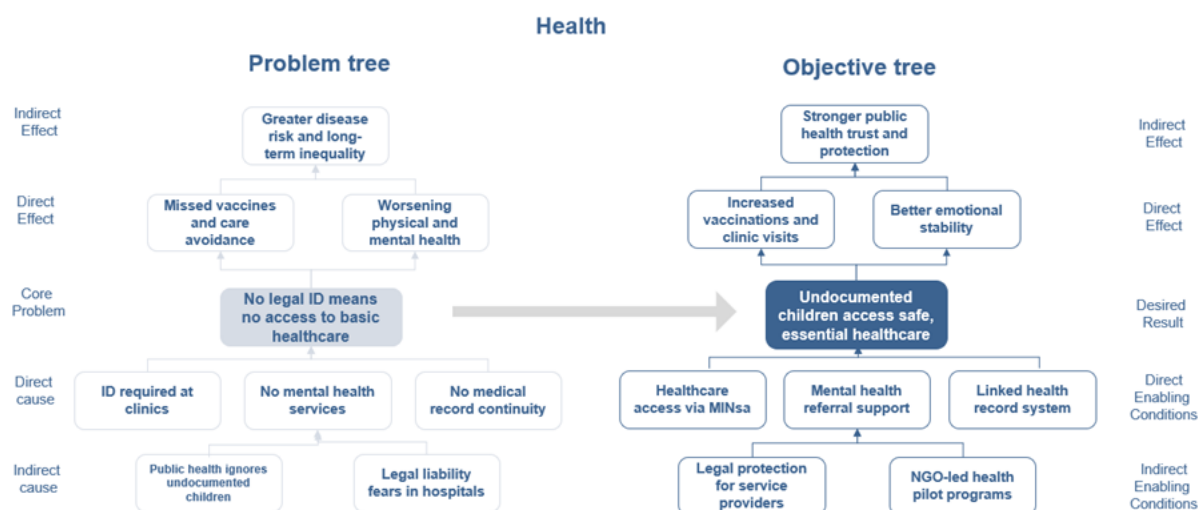




3.3. Health

Undocumented children are excluded from routine and mental health services due to missing IDs and fragmented records. MinSa allows pseudonymous access to care, connects health records, and builds referral systems. NGO pilots and provider protection can improve vaccination, emotional well-being, and healthcare trust.

Figure 5. Problem and Objective Tree: Health





4. Problem Solution: Min(民)Sa Project

4.1 About the Project

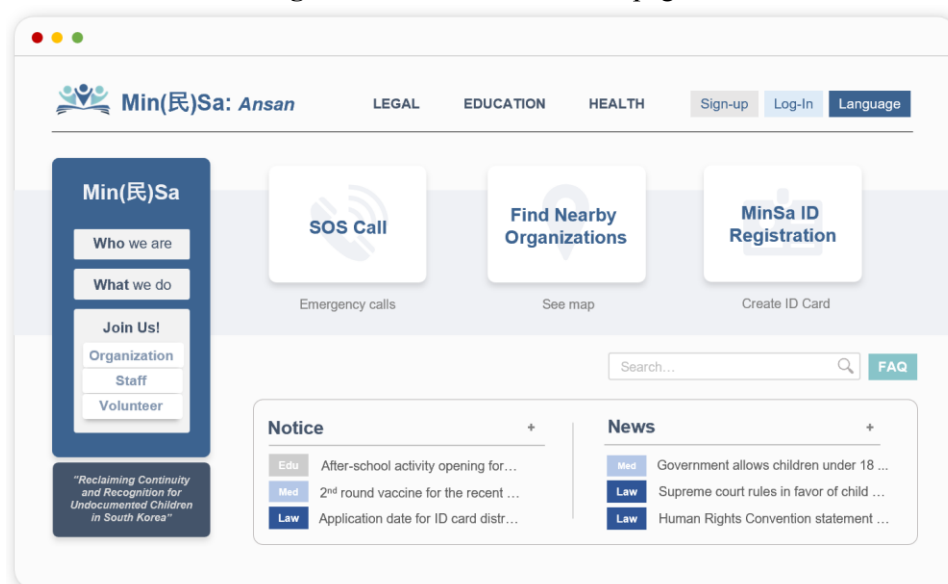
4.1.1 MinSa Portal & Card

The MinSa portal and ID card are designed to provide undocumented migrant children and their families with a secure, rights-based access point to essential services such as education, healthcare, and emergency support without exposing them to legal risk. By creating a pseudonymous yet verifiable civic identity through a Zero-Knowledge Proof (ZKP) based system, the platform aims to bridge the gap between institutional invisibility and practical inclusion. The card acts as a trust-enabling tool for service providers, while the portal serves as a central hub for information, coordination, and safe referrals, ultimately helping to restore basic dignity and continuity in the lives of children who are often excluded from public systems.

The project's central digital infrastructure functions as a tri-layered online portal designed for service providers, undocumented children and their families, and regional organizations. The portal's goal is to allow easier and comprehensive access to necessary information, provide emergency support, ensure anonymity, and issue MinSa ID cards. The overall operation headquarter is planned to be based in one of the cooperating organizations, which in the pilot phase will be the Ansan Global Youth Center. A minimum base degree will be prepared within the Center, such as installing/borrowing one office, a desk, and designating an on-call duty for receiving emergency phone calls or requests.

Below explains the MinSa portal, specifying the details of each section and mechanisms.

Figure 6. MinSa Portal - Main page



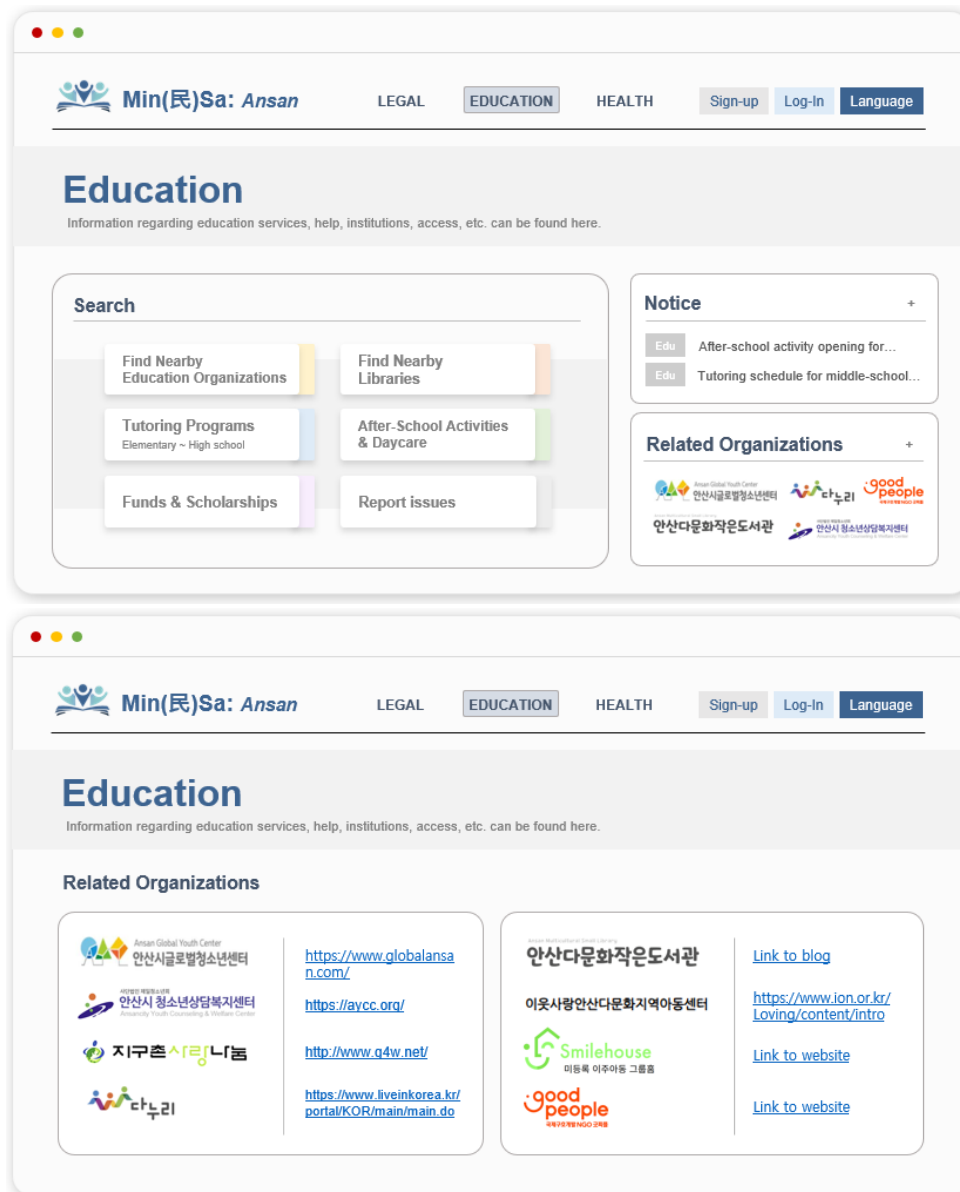
The portal's main page outlines the main features of MinSa, in particular focusing on the legal, educational, and health aspects. The left side panel provides access to pages explaining what MinSa is and its works, as well as pages to register for joining the team. The middle section of the portal displays quick access for emergency class, finding nearby organizations, and registering for MinSa ID Card. The



below section displays notice and news related to undocumented migration children that may be dispersed throughout different websites.

By clicking the language button, users will be able to choose their preferred language among English (default), Korean, Chinese, Uzbek, Russian, and Vietnamese, which are the most common foreign nationalities gathered in Ansan.

Figure 7. MinSa Portal - Education Page



When clicking one of the top three menus, for instance 'education', users will be directed to a page outlining quick search buttons, news related to undocumented migrant children's education, and related organizations that they can access to. More specifically, users can look through nearby education facilities, tutoring opportunities, daycare, funds, etc. Also, links to relevant organizations are available as well.



Figure 8. MinSa Portal - ID Card Registration Page

For the MinSa ID Card registration page, applicants will need to input their user names, date of birth, and telephone number, which will be shown. As for other personal information such as full name or address will not be disclosed to cooperating organizations. The above figure displays an example card image showing the user name, date of birth, primary language, and ID number.

Here, a key feature underpinning this design is the use of Zero-Knowledge Proof (ZKP) technology, which allows users to prove their eligibility for services, such as applying for a MinSa ID or receiving urgent care, without revealing sensitive personal details. For example, when a child registers for the MinSa ID Card through the portal, ZKP enables verification (e.g. of age, residency, or school attendance) to occur without disclosing full identity information to third parties. This ensures anonymity and builds trust, while still giving cooperating organizations enough information to deliver appropriate support securely.

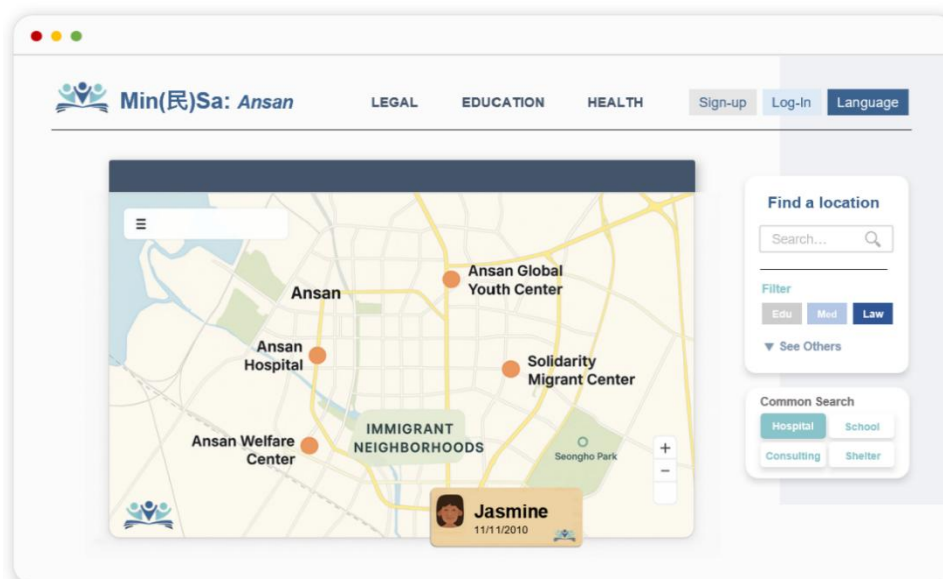
Figure 9. MinSa Portal - ID Card Issuance Process





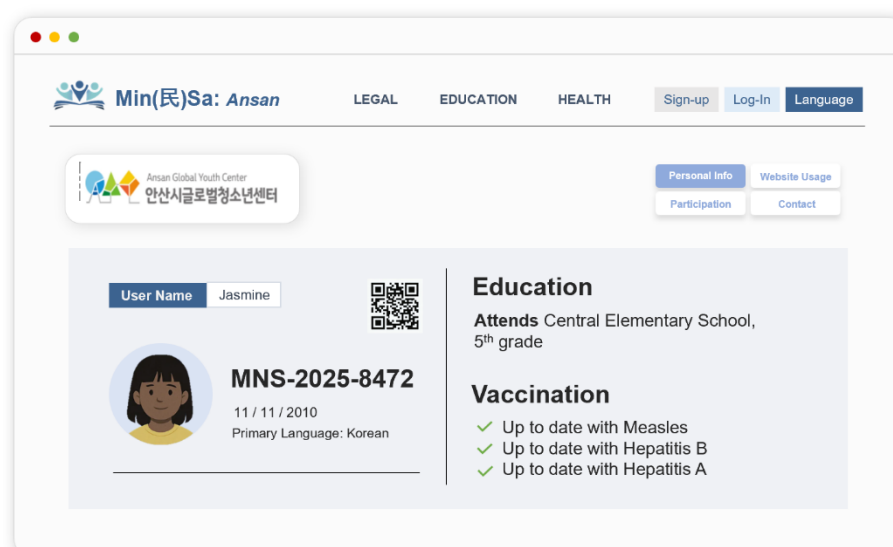
When the registration is finished, applicants will be guided through a 4-step process for receiving the card. This process includes taking an in-person education session to understand what the MinSa card means, its benefits, and methods of usage. Then, an interview will be conducted with MinSa staff from a designated organization to verify personal information and identify the child. As such verification cannot be carried out by public institutions, designating existing organizations such as the Ansan Global Youth Center seems a plausible method for minimum identification. After finalizing this process, applicants will receive a physical copy of their cards.

Figure 10. MinSa Portal - Location Search Page



This page is prepared for easily finding accessible facilities nearby. It can be useful for finding the nearest schools, hospitals, emergency shelters, etc., that children or their families can utilize. On the right side of the webpage, users can also search for facilities using filters or common search buttons.

Figure 11. MinSa Portal - Organizations' Interface



When cooperating organizations access the MinSa portal by scanning the ID card QR code, the above page will show up (sample). The child's user name, date of birth, primary language, attending



schools, and vaccination status will be displayed. This allows checking the child's various status as well as inputting new information, such as participating in an afterschool program hosted by the Ansan Global Youth Center.

Figure 12. MinSa Portal - Staff/Volunteer Recruitment Page

The Staff/Volunteer Recruitment Page of the MinSa portal is designed to facilitate the onboarding of individuals who wish to contribute to the project in roles such as coordinator, educator, interpreter, healthcare provider, or legal assistant. Applicants are asked to submit basic personal information, including name, affiliation, language, and contact details, as well as their availability for weekdays, weekends, or emergencies. They can select one or more preferred roles and upload their CV directly through the portal. A privacy agreement ensures that all submitted information will be securely stored and used only for operational and analytical purposes.

Figure 13. MinSa Portal - FAQ Page

The FAQ Page of the MinSa portal provides accessible, clear answers to common concerns raised by undocumented families. It addresses practical issues such as where to find free or low-cost care, how to enroll a child who only speaks their home language, and the privacy of information shared



through the MinSa platform. Questions about language support and the potential involvement of immigration authorities are also covered, aiming to reduce fear and confusion. Additionally, a Quick Resource Finder on the right-hand side allows users to easily search for nearby schools, clinics, and legal aid services.

4.1.2 MinSa as a ZKP-Based Solution

The MinSa system harnesses the benefits of ZKP's utilization in civic identities. When a child presents their MIN card at a participating school, clinic, or community center, the system runs a ZKP protocol that verifies predefined claims, such as "Up to date with Hepatitis A", "Attends Central Elementary School. These claims are checked without accessing the child's name, birthplace, or immigration status, and without storing any personally identifiable information in a central server. Instead, each verification acts as a "yes or no" confirmation, produced locally and visible only to authorized personnel. This ensures that eligibility is verifiable while identity remains concealed.

MinSa's ZKP layer enables a reimagination of public service delivery: one where civic presence can be acknowledged without legal exposure. It empowers frontline institutions to act in ethically responsible ways, providing care, education, or protection without requiring legal documentation. At the same time, it preserves the integrity and auditability of service delivery for regional and national authorities. In this way, MinSa does not simply mediate between undocumented families and the state; it constructs a digital architecture of trust, where the right to be cared for can coexist with the right to remain unseen.

Figure 14. ZKP System Architecture for Anonymity-Preserving Accountability

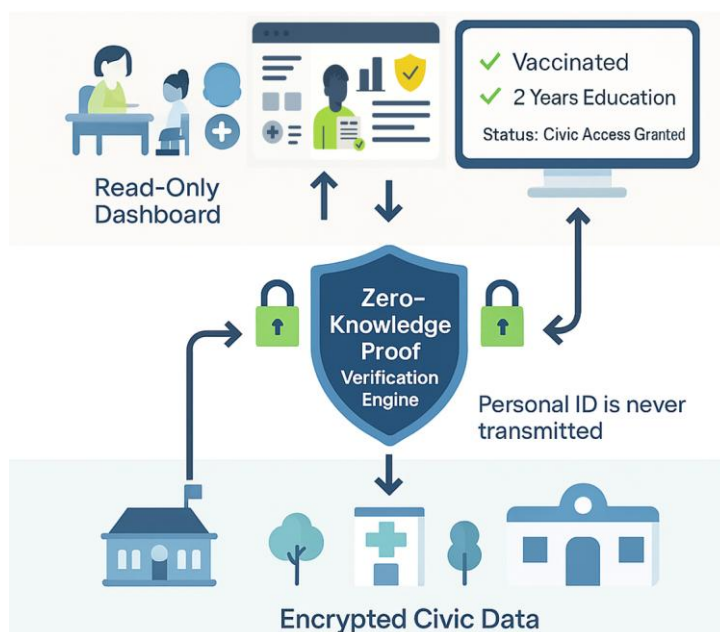
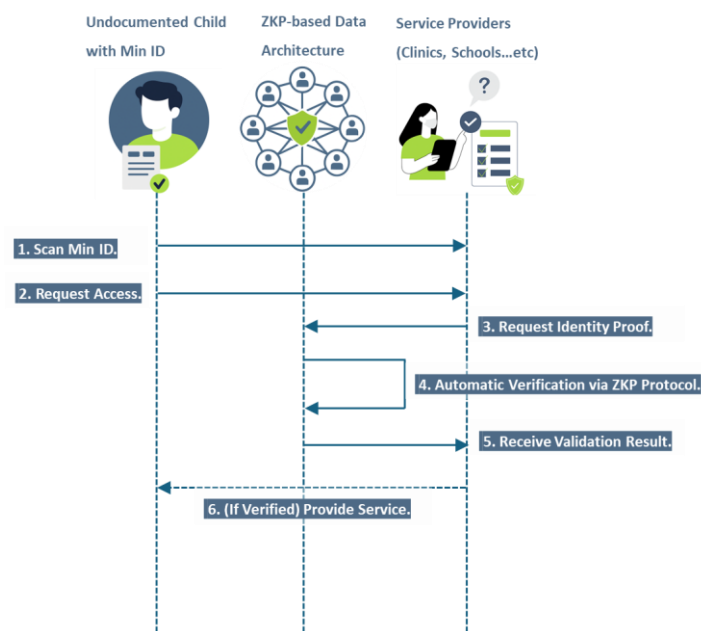




Figure 15. Data Flow Chart of ZKP-based MinSa (Modified from Bai, T. et al., 2022)



This infographic breaks down how the MinSa system uses ZKP to protect identity while enabling access. Step 1: A child presents their MIN ID, which is scanned by a service provider—such as a clinic or school. Step 2: The provider requests access. Step 3: Instead of demanding personal identification, the provider sends a request for proof of eligibility to the ZKP-based data system. Step 4: The ZKP engine verifies the encrypted claim (e.g., vaccination, school attendance) without revealing sensitive data. Step 5: The provider receives a simple binary result, ‘Yes’ or ‘No’, confirming whether the child meets the criteria. Step 6: If validated, the child receives the service, without disclosing legal name, nationality, or immigration status. The process is secure, ethical, and centered on trust, not surveillance.

4.1.3 Impacts and Significance of MinSa

How would MinSa function in a real-life situation? To demonstrate its functionality, the following section presents an imagined narrative of Jonathan, an undocumented Indonesian child. Through his story, we explore the concrete impacts and broader significance of MinSa as a civic infrastructure. By tracing how a pseudonymous Migrant Identification Number enables access to essential services while protecting identity, this narrative illustrates how MinSa reconfigures conventional notions of recognition, belonging, and protection in contexts of legal anonymity.

Jonathan was born in Suwon, South Korea, but legally, he does not exist. His Indonesian parents were undocumented, and neither the Korean government nor the Indonesian embassy recognized his birth. Without a birth certificate or any form of legal identification, Jonathan became one of Korea’s many “visible but invisible” children—present in daily life but excluded from schools, clinics, and the law.





1) Restoring Identity Without Exposure



For children like Jonathan, an undocumented 10-year-old from Indonesia living in Seoul, the absence of legal recognition does more than block access to schools or clinics: it erodes a sense of self. Without any formal acknowledgment of his presence, Jonathan drifts between spaces, at home, in the neighborhood, on public transport, never fully certain whether he belongs. Although he is able to attend school due to the Ministry of Education's temporary policy, he is unable to get his own phone number or participate in mandatory health checkups, and absorbs the silent message that he is not meant to be seen.

MinSa offers more than functional access to services; it provides a symbolic and practical anchor for self-recognition. With a pseudonymous Migrant Identification Number (MIN) Card, Jonathan can hold a civic identity, not tied to his passport or immigration status, but to his actual life in the community. When he shows his MIN at a local library or when he receives a vaccination at a clinic, Jonathan is reminded: *I am here, and I am part of this society.*

Over time, this recognition fosters a deeper sense of belonging. MinSa reframes identity not as a legal category, but as a lived and acknowledged presence. For undocumented children, this is the beginning of civic inclusion. The inclusion made possible not through paperwork, but through participation, memory, and the quiet affirmation that they matter.

2) Social Service Access

Undocumented children are often excluded from essential services not by explicit denial, but by the lack of safe, recognized ways to verify their presence. MinSa bridges this gap by providing a pseudonymous but verifiable identity, enabling access without exposing legal status. It does not replace existing systems but supplements them, allowing schools, clinics, and legal aid providers to serve vulnerable children without triggering immigration enforcement. In doing so, MinSa affirms that basic rights - education, health, and protection - should be accessible regardless of status. The sections that follow illustrate how this works in practice through the story of Jonathan and his family.

Legal



Jonathan's mother, Yona, works long hours in Seoul without legal protection and avoids hospitals or legal offices out of fear of deportation. With a MinSa-issued MIN, she could safely consult legal aid clinics about her son's birth registration, guardianship, or potential humanitarian relief without disclosing her immigration status. If Jonathan ever applies for asylum or voluntary repatriation, his MIN profile would serve as a verified digital record of civic presence.



More broadly, MinSa functions as a preventative legal safeguard. It embeds protective presence into community data systems, allowing authorities and NGOs to identify and support children at risk of abuse, trafficking, or neglect without triggering immigration enforcement. This visibility without exposure enables states to monitor service distribution and uphold child welfare without conflating legal status with entitlement. By balancing institutional integrity with individual dignity, MinSa offers a rights-aligned model of legal governance in irregular migration contexts.

Educational



When Jonathan was younger, he was turned away from daycare due to a lack of legal documentation. After relocating to Ansan, a rare municipality offering informal support for undocumented families, his schooling remained inconsistent, with frequent moves causing repeated disruptions. Had MinSa existed, Jonathan could have enrolled using his pseudonymous MIN profile, allowing schools to verify age, guardianship, and attendance eligibility without requiring a resident

registration number or foreign ID. His academic records could have been preserved independently of legal name or location, ensuring continuity even through relocation.

More broadly, MinSa removes a critical barrier to education by offering a parallel civic infrastructure that supports school enrollment and participation while respecting legal ambiguity. The MinSa Portal allows easier access to education facilities, tutoring programs, or daycare services, facilitating families like Yona's to engage in educational life without fear. By reducing institutional hesitancy and upholding the principle of education as a universal right, MinSa establishes a replicable model for inclusive governance, fostering collaboration among schools, NGOs, and child support networks.

Health



Jonathan has never received formal vaccinations. Out of fear of detection, his mother Yona avoids clinics where legal checks are routine and instead relies on pharmacies for basic care. With a MinSa-issued MIN, Jonathan could access essential health services, such as vaccinations, pre-school check-ups, and emergency care, simply by presenting his MIN ID. No passport or resident registration would be required. A quick scan of his MIN QR code could verify eligibility and retrieve his health

history, including prior screenings, chronic conditions, or allergy records, ensuring safe and continuous care even if the family relocates.



Beyond physical health, MinSa would enable access to mental health and counseling services; critical for children facing prolonged insecurity and trauma. For healthcare providers, MinSa offers a rights-based solution to an ethical dilemma: the ability to treat without triggering immigration enforcement. By embedding protective presence into healthcare systems, MinSa allows public institutions to uphold child health responsibilities while maintaining privacy and public trust. Over time, it can be linked with official registries if the child's status normalizes, supporting a smooth transition from informal to formal care. MinSa thus serves as a cost-effective, privacy-conscious model for inclusive health governance in migrant-receiving societies.

3) Life Transitions (Liminality)

When Jonathan's family moved from Incheon to Ansan, he lost access to the informal learning center he had attended for nearly a year. There were no academic records, no vaccination certificates, no documentation to show where he had been or what he had learned. With each relocation, he had to start over – not only socially and emotionally, but bureaucratically. For undocumented children like Jonathan, life transitions often mean erasure rather than progression.



MinSa helps preserve continuity through these fractured journeys. With a persistent, pseudonymous MIN profile, Jonathan could carry forward a verified record of his education, health history, and community participation, regardless of where he lives or whether his legal status changes. This civic thread, such as track records of users' educational status or vaccination history within the portal - helps children maintain stability through adolescence, school transfers, or shifts in guardianship.

MinSa also prepares children for more complex transitions. If Jonathan is later regularized, recognized as a refugee, or applies to a university, his MIN profile can be securely linked to national education databases or identity systems, easing the process of enrollment, financial aid, or re-documentation. Even if he chooses to return to his family's country of origin, his profile will offer a portable civic history; evidence of his presence, growth, and participation in Korean society. In this way, MinSa is not merely a technical fix but a protective infrastructure that accompanies children across the uncertain thresholds of undocumented life, allowing them to move forward with coherence, dignity, and agency.



4) Toward Structural Change: Visibility, Data, and Social Recognition



MinSa not only supports individual undocumented children. It also strengthens the foundations of inclusive governance. For children like Jonathan, who exist at the edges of legal and institutional recognition, MinSa transforms invisibility into civic presence. Through pseudonymous participation, it enables the secure collection of demographic data—age, education, health, and location—without requiring legal identity.

This aggregated data addresses a longstanding blind spot in national planning. Ministries and local governments can design more equitable and cost-effective programs, guided by real patterns of need.

Beyond administrative impact, MinSa reshapes how undocumented children are understood, not as exceptions to be managed, but as members of society with shared stakes and futures.

By shifting the focus from legal status to human rights, MinSa also lays groundwork for broader reforms: streamlined birth registration, alternatives to detention, and protections for stateless youth. Its anonymized records can support national reporting to international bodies, signaling a commitment to upholding child rights even under legal precarity. In recognizing children like Jonathan, not as invisible, but as present, MinSa invites a new kind of civic imagination.

4.1.4. Strategy: How to reach out

To effectively introduce the MinSa portal and ID card to undocumented migrant communities, building trust through local networks is essential. Partnering with migrant community leaders, cultural associations, and religious groups can help present the platform in familiar, trusted environments. These intermediaries can play a vital role in fostering comfort and credibility among families who may be hesitant to engage with formal systems. Furthermore, equipping frontline staff at local institutions such as schools, daycare centers, clinics, and NGOs is another critical strategy. These individuals could serve as the first point of contact for undocumented families and can guide them through the registration process with care and clarity.

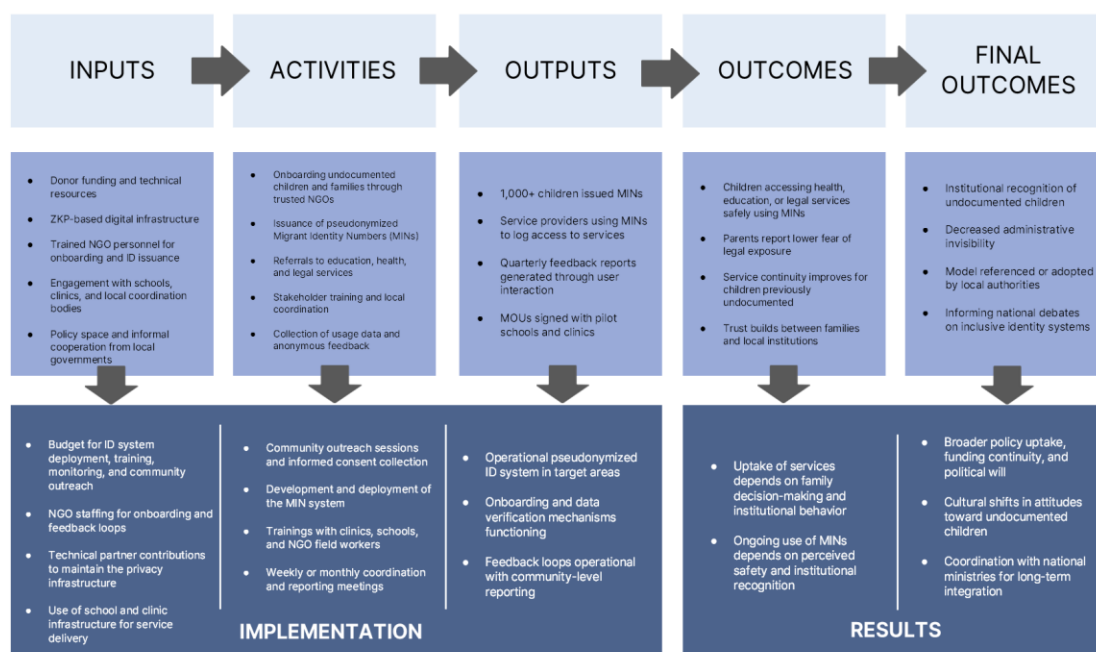
All outreach and communication efforts must be designed with cultural sensitivity and inclusivity at the core. To incentivize participation, small care packages or service vouchers can be offered in collaboration with local sponsors, signaling welcome and appreciation. Ultimately, the strategy should focus on accessibility and long-term inclusion: meeting families where they are and ensuring the MinSa platform becomes a trusted, community-rooted tool for support and empowerment.



4.2. Implementation Strategy and Phase

4.2.1 Theory of Change (ToC)

Figure 16. MinSa ToC



4.2.2 Project Development Matrix (PDM)

Table 5. MinSa PDM

Level	Narrative Summary	Indicators	Means of Verification	Assumptions
Goal	Ensure undocumented children can access basic services through a secure civic identity without legal exposure	≥ 70% of MIN recipients access education or health services within 6 months	Aggregated and anonymized service usage data from partner schools and clinics, digital access logs	Continued cooperation from NGOs and informal government support
Purpose	Implement a trusted Zero-Knowledge Proof-based onboarding and service access platform for undocumented children	1,000 MINs issued; ≥ 700 successful service linkages	Card issuance database, linked school/clinic entry records	Migrant families are reachable and willing to participate
Outcomes	<ul style="list-style-type: none"> Production and distribution of 1,000 encrypted MIN cards Partnership with at least 7 community institutions Educational materials on service access rights Trained interviewers (protocols) 	Quantified distribution data, partner onboarding logs, qualitative user testimonials	Project activity logs, midterm reviews, follow-up interviews	Timely hardware procurement; no major system bugs during pilot
Activities	<ul style="list-style-type: none"> Finalize MOUs and onboard field partners Localize onboarding tools and digital assets Train NGO workers on ZKP onboarding protocol Produce and issue encrypted MIN cards Facilitate service access through school/clinic collaboration Conduct midterm and final evaluations 	Activity completion within schedule and pilot scope	Monthly activity tracking, reporting templates, field validation	Field partners retain staff continuity and commitment



4.2.3. Implementation Phase (I, II, III)

Table 6. MinSa Phase (I, II, III)

Phase	Timeline	Key Activities	Stakeholders	Objectives
Phase I: Regional Preparation	0–6 months	<ul style="list-style-type: none"> Secure local partnerships with NGOs, schools, clinics Develop digital infrastructure and localized MinSa materials Conduct community trust-building and awareness sessions Train NGO and clinic staff on privacy protocols and ZKP basics 	Local NGOs, migrant community leaders, health/education centers, legal aid groups	<ul style="list-style-type: none"> Lay groundwork for ethical and technical implementation Establish stakeholder alignment and local legitimacy
Phase II: Regional Pilot Deployment	6–12 months	<ul style="list-style-type: none"> Distribute MIN IDs to 1000 + undocumented children Launch MinSa portals for schools and clinics Activate ZKP-based verification for vaccine, attendance, and civic access Gather real-time feedback and improve UX Monitor legal/ethical challenges in practice 	Local governments, public service institutions, data privacy experts	<ul style="list-style-type: none"> Validate core functionality Build trust among users and providers Generate initial anonymized data for policy learning
Phase III: Programmatic Expansion	12–36 months +	<ul style="list-style-type: none"> Scale to additional cities and provinces Introduce mobile enrollment kits (for remote or transient families) Integrate dashboard access for service planners (read-only) Draft policy briefs using MinSa-generated statistics Explore future legal recognition pathways based on MinSa history 	Ministries (MOHW, MOE, MOJ), regional policy labs, SDG alignment bodies	<ul style="list-style-type: none"> Extend impact nationally while protecting anonymity Position MinSa as policy infrastructure for inclusive service design



4.3. Timeline

Table 7. MinSa Timeline: Phase (I, II, III)

Category	Phase I: Regional Preparation (0–6 months)	Phase II: Ansan Regional Pilot Deployment (6–12 months)	Phase III: Programmatic Expansion (12–36 months)
Platform Development / Tech Infrastructure	<ul style="list-style-type: none"> • Build prototype of secure QR-based MIN system • Design encrypted local storage logic • Develop ZKP engine prototype (education & health claims) • Establish multilingual UI skeleton 	<ul style="list-style-type: none"> • Launch operational MinSa web/app platform • Deploy ZKP-based verification system in pilot sites • Begin real-time backend monitoring integration 	<ul style="list-style-type: none"> • Scale platform to new regions • Integrate with regional education/clinic dashboards • Develop versioning, analytics dashboard, and multilingual support modules
Human Resources and Training	<ul style="list-style-type: none"> • Identify & onboard core community stakeholders (NGOs, clinics, schools) • Conduct privacy and ZKP awareness workshops • Develop training materials 	<ul style="list-style-type: none"> • Train local officials, clinic workers, and educators on scanning, data input, and QR protocols • Deploy helpdesk support for pilot users 	<ul style="list-style-type: none"> • Conduct train-the-trainer modules for new regions • Institutionalize capacity-building programs within regional NGOs and public agencies
Field Implementation	<ul style="list-style-type: none"> • Design trust-building outreach materials • Hold community forums to explain MinSa purpose and benefits • Recruit target undocumented families for voluntary pre-enrollment 	<ul style="list-style-type: none"> • Distribute MIN cards to 1000+ children • Enable QR scanning at participating clinics and schools • Facilitate regular follow-up by field coordinators • Continue Community Forums and registration guidance 	<ul style="list-style-type: none"> • Expand distribution hubs to mobile teams (e.g., migrant markets, shelters) • Deepen partnership with city-level service planners • Embed QR verification into day-to-day workflows
Monitoring, Evaluation, and Advocacy	<ul style="list-style-type: none"> • Develop indicators and baseline assessment plan • Establish secure data collection protocols • Draft advocacy roadmap based on use case scenarios 	<ul style="list-style-type: none"> • Monitor service access via anonymized dashboards • Conduct midline evaluation with user interviews and stakeholder feedback • Begin publishing anonymous usage trends 	<ul style="list-style-type: none"> • Launch public reports for policy engagement • Develop policy briefs for ministries and local assemblies • Integrate MinSa data insights into long-term regularization strategies



4.4. Budget

Table 8. MinSa Budget by Category

Category	Sub-Item	Description	Estimated Cost (USD)
Platform Development & Tech Infrastructure	Civic tech team (2 devs, 1 designer, 1 PM)	Freelance/NGO partner (6 mo part-time)	\$25,000
	Data security audit & privacy protocol	One-time audit + consultant	\$4,000
	Cloud hosting & encrypted database	Scalable backend with access logs	\$1,500
	Multilingual UI development	English (default), Korean, Chinese, Uzbek, Russian, and Vietnamese	\$3,000
	Subtotal		\$33,500
Human Resources & Training	Program coordinator (12 months)	Lead implementer across pilot sites	\$18,000
	3 local NGO coordinators	Community liaison, case managers	\$15,000
	Registrar training workshops	Training materials + 3 full-day sessions	\$4,000
	Translation & interpretation	For outreach + training	\$2,000
	Subtotal		\$39,000
Field Implementation	Equipment grants	10 tablets, 3 laptops	\$5,000
	MinSa Registrar stipends	\$100/mo × 12 mo × 15–20 staff	\$18,000
	Participant transportation & food	Education sessions access/trust	\$2,000
	Printing (manuals, flyers, ID slips)	For outreach and access	\$1,500
	Legal clinic collaboration honorarium	Pro bono partners	\$2,000
	Subtotal		\$28,500
Monitoring, Evaluation & Advocacy	Monitoring & QA	Part-time RA + audits	\$3,500
	Community co-design meetings	x3 local sessions	\$2,000
	Final report & policy brief	English + Korean	\$3,000
	Showcase event/roundtable	With Seoul City, MoJ, NGOs	\$2,500
	Subtotal		\$11,000
Contingency & Admin Buffer	Unforeseen fixes, community needs	(~10% of core budget)	\$11,500
Total Estimated Budget (Year 1)	For Phase I–II pilot implementation		\$123,500

Notes:

- Phase III (scaling to 8–10 cities) would benefit from reduced tech costs (already built) and economies of scale.
- Future costs may also be co-funded by local government inclusion funds, UNICEF Korea, or migrant-focused foundations, and Open-source release could be supported by civic tech accelerators like [Code for All](#) or [Mozilla Open Source Support](#).



4.5. Monitoring & Evaluation

4.5.1 Evaluation Plan Using OECD DAC Criteria

The MinSa project adopts OECD DAC criteria to monitor and evaluate the quality, relevance, and longer-term potential of its interventions. This framework allows for a structured assessment of performance, particularly at midline and endline stages, and supports accountability to funders, partners, and beneficiary communities.

Evaluation will be conducted in collaboration with implementing partners and local stakeholders, using both qualitative and quantitative data.

Table 9. OECD DAC Evaluation Matrix

Criterion	Evaluation Question	Indicator(s)	Data Source	Method
Relevance	Does MinSa address the real needs of undocumented migrant children and align with national/international rights frameworks?	Policy and community alignment with child rights frameworks	Project documents, NGO interviews, UN CRC comparison, domestic law reviews	Document review, key informant interviews
Effectiveness	To what extent has the project achieved its intended outcomes (e.g., safe access, reduced fear)?	% of undocumented children accessing services	Clinic/school usage logs, onboarding records, user surveys	Quantitative analysis, longitudinal tracking
Efficiency	Were MinSa's resources (staff, tech, time) used optimally to deliver intended services?	Cost per child onboarded and linked to services	Project budgets, financial records, time-use logs	Cost-efficiency analysis
Impact	What long-term systemic or behavioral changes occurred (e.g., trust, institutional adaptation)?	Service retention rates, qualitative shifts in trust and visibility	Interviews, focus groups, periodic M&E reports	Qualitative analysis
Sustainability	Can the MinSa model be sustained by local actors after external funding ends?	Operational continuity by NGOs/schools without external support	Post-project documentation, exit readiness interviews with stakeholders	Ex-post review, sustainability assessment
Coherence	Are MinSa's objectives and activities aligned with existing education, health, and migration policies?	Presence of institutional policy references to or integration with MinSa	Education ministry memos, inter-agency meeting minutes, government policy documents	Policy mapping, alignment scoring, stakeholder interviews



4.5.2 Ethical Considerations and Risk Management

The MinSa project prioritizes ethical implementation by safeguarding the rights, privacy, and dignity of undocumented migrant children and their families. Core principles include informed consent, voluntary participation, data protection, and do-no-harm practices.

The project's risk management strategy addresses operational, technological, and political risks that may arise during implementation.

Table 10. Risk Management Matrix

Risk	Potential Impact	Mitigation Strategy
Low use due to remaining fear of legal exposure	Reduced service utilization; failure to meet inclusion goals	Engage community-based NGOs for onboarding; ensure anonymity through pseudonymized IDs (MinSa); clarify non-reporting safeguards; promotion and advertisement on the integrity of MinSa system in regard to personal data protection
Resistance from public service providers	Inconsistent recognition of MinSa; fragmented service delivery	Conduct stakeholder dialogues before and after rollout; formalize recognition through MOUs; integrate into local pilot programs
Data privacy breach or system failure	Loss of trust; harm to beneficiaries	Employ Zero-Knowledge Proof protocols; ensure encryption and decentralized storage; maintain offline backups
Staff burnout or NGO attrition	Delays in onboarding and follow-up; reduced quality of service	Phase implementation; provide training incentives; facilitate peer learning and shared resource systems; codesigning protocols and application for MinSa

MinSa will also adopt participatory feedback channels to continuously assess ethical concerns from users and frontline partners. All research and data collection activities will be reviewed in accordance with institutional ethics protocols and international child protection standards.

4.5.3 Stakeholder Analysis

MinSa's success depends on the coordinated engagement of diverse stakeholders across the legal, education, health, and civil society sectors. Each actor plays a critical role in ensuring effective implementation, legitimacy, and sustainability of the MIN (Migrant Identity Number) system.



Table 11. Key Stakeholders and Roles

Stakeholder	Role	Engagement Strategy
Undocumented migrant children and families	Primary beneficiaries; users of the MIN system; co-creators of onboarding information and participants in feedback loops	Community outreach, informed consent, continuous feedback loops
Local NGOs and community-based organizations	Frontline actors for onboarding, training, ID verification, referral to services, and trust-building	Joint training workshops, peer learning networks, co-design of implementation strategies
Public service providers (schools, clinics, legal support)	Recognition and operational use of the MIN for service delivery <ul style="list-style-type: none"> Schools: accept MINs as valid proof for school access; contribute anonymized attendance logs Clinics: vaccination and primary care access for children using MINs Legal support: provide basic legal counselling; facilitate referrals to legal aid 	Joint MOUs with clear use protocols; integration into administrative routines; periodic coordination meetings
Technology partners	Build and maintain ZKP-based ID issuance and verification infrastructure	Co-design sessions with NGO and user input; sandbox testing before rollout; shared governance on data and system updates

Stakeholder engagement is structured to be iterative, transparent, and responsive, keeping the project grounded in community needs while remaining compatible with institutional frameworks. The approach deliberately distributes responsibilities across sectors so that no single actor is overburdened, yet all contribute meaningfully to building a safe and trustworthy environment for undocumented children.

By connecting educational institutions, community health providers, civil society organizations, and privacy-focused technology developers, the MinSa system fosters both resilience and legitimacy. This integrated model strengthens bottom-up participation while supporting alignment with broader service systems.

4.5.4 Sustainability Strategy and Insights for Future Scale-Up

MinSa functions as a pilot project with potential for broader application, with its foundation resting on three principles: local ownership, technical flexibility, and alignment with existing public service systems. Core activities such as onboarding, service coordination, and user feedback are co-managed by NGOs and public service providers to build operational continuity beyond the initial phase.

Following the pilot, an external evaluation and a finalized operational manual will support the transition of responsibilities to local stakeholders. This process will be reinforced through structured



capacity-building, ongoing technical support, and the documentation of practical outcomes to ensure institutional learning. Engagement with relevant government ministries will take place in parallel, using evidence from the pilot to explore formal integration of the MinSa system into routine service delivery.

Future expansion should prioritize legal protection, operational efficiency, and adaptability to other regions or underserved populations. As local implementation mechanisms are strengthened, municipal and district governments may take on more active roles in facilitating space, coordination, and public engagement. In the long term, institutional sustainability will depend not only on political commitment and financial investment but also on the development of a legal framework that recognizes and protects undocumented children. Building on the pilot's outcomes, we hope that the MinSa model could serve as a foundation for future policy proposals or legislative initiatives that formally recognize and protect the legal status of undocumented migrant children within national systems.



5. Conclusion

MinSa offers an innovative, rights-based approach to an urgent yet overlooked humanitarian gap: the civic exclusion of undocumented migrant children. At its core, MinSa is a tool for constructing civic identity without requiring legal status, providing children with a means to be seen, supported, and protected in the very systems they are most often excluded from. Through pseudonymized profiles and privacy-preserving verification mechanisms, MinSa harmonizes anonymity with accountability: providing safe access to essential services such as healthcare, education, and legal protection, while ensuring that institutional providers remain compliant with laws and ethical obligations.

The name Min(民)Sa (민사) carries special resonance in the Korean context. The character 민(民) translates to “the people”, a term historically rooted in democratic struggles and inclusive governance. By placing 민(民) at the center of this civic-tech initiative, MinSa emphasizes that all children residing in a society, regardless of nationality or legal status, belong to its public concern.





Thereby, MinSa addresses the “liminal condition” of undocumented children, physically present yet administratively absent, by enabling immediate access to essential services like healthcare, education, and legal support, while laying the groundwork for long-term civic inclusion through anonymized data records. Designed to work within existing institutional and civil society frameworks and provide them with a harmonious way to integrate via scalable data systems, MinSa offers a politically viable and operationally practical solution with minimal dissonance. In high-digital societies like South Korea, its implementation is not just feasible: it is long overdue.

In the long run, MinSa becomes more than just a service layer; it functions as a trust architecture that affirms the child’s civic presence even in legal ambiguity. It is a model that can be adapted, localized, and expanded across regions where undocumented populations are growing, yet protection remains thin. Ultimately, MinSa bridges the gap between anonymity and verifiability, offering a dignified, scalable pathway to inclusive governance - one that acknowledges presence, verifies need, and protects identity, without requiring permission to exist.





Alignment to SDGs


Core SDGs

Goal	Relevant Content
	SDG 3 – Good Health and Well-being MinSa allows access to vaccinations, health check-ups, and mental health care without disclosing legal status, ensuring health rights and protection. This reduces preventable illnesses and trauma while enabling caregivers to seek help without fear of deportation.
	SDG 4 – Quality Education Through pseudonymous IDs, MinSa enables school enrollment, academic record continuity, and access to educational programs, restoring learning opportunities. It also fosters trust between schools and undocumented families, promoting long-term educational inclusion.
	SDG 10 – Reduced Inequalities MinSa reduces barriers related to legal status, language, and income by enabling secure access and informing equitable policies with disaggregated data. It transforms invisibility into recognition, fostering structural inclusion for the most marginalized.
	SDG 17 – Partnerships for the Goals With over 29 cross-sector partners, MinSa creates a decentralized, trust-based support system, embodying SDG 17's vision of inclusive collaboration. The model encourages shared responsibility and co-designed service delivery for sustainable impact.

Supporting SDGs

Goal	Relevant Content
	SDG 1. No Poverty MinSa enables undocumented children to access essential services without legal exposure, breaking intergenerational poverty cycles and ensuring survival rights. By providing a safe entry point to public support systems, it lays the groundwork for inclusive care and long-term social mobility.
	SDG 5 – Gender Equality MinSa empowers mothers to engage in their children's education and health safely, restoring caregiving rights and reducing gender-based exclusion. This affirms the right to care with dignity and strengthens the role of women as active protectors of their families.



	<p>SDG 17 – Partnerships for the Goals</p> <p>With over 29 cross-sector partners, MinSa creates a decentralized, trust-based support system, embodying SDG 17’s vision of inclusive collaboration. The model encourages shared responsibility and co-designed service delivery for sustainable impact.</p>
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