Social Return on Investment (SROI) Analysis Report

Sustainable Healthcare System driven by the Data from Functional Health Care Organizations and IT Platform of Network for Health Care Providers Implementation to Upper Northern Thailand

Princess Sirindhorn IT Foundation
Craniofacial Center
Chiang Mai
University (SCFC)

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Sustainable Healthcare System Driven by the Data from Functional Health Care Organizations and IT Platform of Network for Health Care Providers Implementation to Upper Northern Thailand

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Awarded 20/04/2026

Signed

Mr Ben Carpenter
Chief Executive Officer
Social Value International

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1. EXECUTIVE SUMMARY

The Sustainable Healthcare System driven by the Data from Functional Health Care Organizations and IT Platform of Network for Health Care Providers Implementation to Upper Northern Thailand—implemented by The Princess Sirindhorn IT Foundation Craniofacial Center, Chiang Mai University (SCFC)—aims to strengthen a multidisciplinary service system for patients with cleft lip, cleft palate, and craniofacial conditions across eight northern provinces of Thailand. Through coordinated clinical pathways, development of an integrated patient information system, and sustained capacity-building for healthcare personnel, the project enhances treatment continuity, reduces the burden on families, and improves system-wide efficiency. This Social Return on Investment (SROI) assessment evaluates the project's economic and social value over the full 3-year implementation cycle (2023–2025) and captures benefits that continue for up to three years after project completion, following SVI principles of materiality, transparency, and impact verification.

The analysis identifies key stakeholders—including patients, families, multidisciplinary medical teams, provincial health authorities, funding organisations, and external partners—and maps the outcomes they experienced. Evidence gathered from stakeholder interviews, administrative records, and clinical follow-up data shows substantial positive changes: reduced developmental delays, increased confidence and social participation among patients, reduced parental stress and anxiety, time and cost savings for families, enhanced professional competencies of healthcare providers, and strengthened provincial and inter-organizational networks. These outcomes were valued using credible financial proxies such as minimum wage rates, government budget benchmarks, shadow prices of life satisfaction, and public-sector training rates.

After applying SROI impact adjustments (deadweight, displacement, attribution, and drop-off) and discounting future values at 3.5%, the project generated a total social value of THB 99,828,493.43. This value is compared against a total cumulative investment of THB 22,806,475.62 (covering all resources utilized during 2023–2025). As a result, the project achieved an SROI ratio of 4.38 : 1, indicating that every THB 1 invested produced THB 4.38 in social value. More than half of the total social value accrues to families (60.45%), largely through reduced stress and anxiety and reduced burden from hospital visits, including time savings and lower work absence. Patients receive 10.12% of total value, while the remaining value is generated through improved coordination, professional benefits, and institutional gains across the health service network and the Craniofacial Center.

Building on the outcome evidencing and valuation approach described above, Table A presents a consolidated summary of the material outcomes included in the SROI model. For each stakeholder group, the table shows the outcome taken forward for valuation, the indicator used to evidence change, the financial proxy applied, the assumed duration of impact, the attribution assigned to the project, and the resulting estimated net social value.

Table A Summary of Material Outcomes and Net Social Value by Stakeholder Group

Stakeholder Group	Material Outcome	Measurement Indicator	Financial Proxy (Valuation Basis)	Impact Duration (Years)	Attribution to Project (%)	Net Social Value (THB)
S1.1a Patients aged 0–3 years	Reduced developmental delays	Number and proportion of patients demonstrating improvement in age-appropriate developmental milestones (speech, feeding, motor skills) following treatment	Avoided cost of development activities: THB 780.75 per person/year (OBEC student development budget 2024)	4 Years	75%	602,958.70
S1.1b Patients aged 3–12 years	Mixed (development + confidence)	Number and proportion of patients (aged 3–12) demonstrating developmental progress and/or improved participation in school/social settings (based on dominant outcome)	Avoided cost of development activities (THB 780.75) and cost of personality development training (THB 4,200)	4 Years	75%	2,619,132.90
S1.1c Patients aged 12 years and above	Increased confidence and social participation	Number and proportion of patients demonstrating increased confidence in social interaction and participation	Cost of self-confidence / personality development training: THB 4,200 per course (CMU Lifelong Learning Institute 2024)	4 Years	50%	6,879,873.29

Stakeholder Group	Material Outcome	Measurement Indicator	Financial Proxy (Valuation Basis)	Impact Duration (Years)	Attribution to Project (%)	Net Social Value (THB)
S1.2 All Patient Families (applied across the eligible family group)	Reduced stress and anxiety (caregivers)	Number and proportion of caregivers reporting reduced stress and anxiety	Cost of depression / mental health treatment: THB 1,775 per 16-week cycle (TDRI 2012)	2 Years	50%	55,661,324.64
S1.2.1 Patient families without travel/compensation support	Time saved (visits & work absence)	Number and proportion of caregivers reporting reduction in number of hospital visits and caregiver workdays lost per year	Opportunity cost of time: THB 236.78 per day (Average minimum wage in Northern Thailand, Ministry of Labour 2022)	2 Years	100%	4,149,102.12
S1.2.2 Patient families receiving travel/compensation support	Time saved (visits & work absence)	Number and proportion of caregivers reporting reduction in number of hospital visits and caregiver workdays lost per year	Opportunity cost of time: THB 236.78 per day (Average minimum wage in Northern Thailand, Ministry of Labour 2022)	2 Years	50%	532,429.00
S2.1 Craniofacial Center, Chiang Mai University (SCFC)	Enhanced institutional reputation and credibility	Evidence of increased recognition, trust, and subsequent budget allocation attributable to the project	Increased budget allocation / funding gained in the following year	1 Year	100%	17,703,080.00
S1.3 Maharaj Nakorn Chiang Mai Hospital, CMU	Increased staff satisfaction	Number and proportion of staff reporting increased job satisfaction and fulfilment	Shadow price of life satisfaction / wellbeing: THB 4,637 per month (Chandduaywit 2014)	4 Years	75%	8,792,141.46

Stakeholder Group	Material Outcome	Measurement Indicator	Financial Proxy (Valuation Basis)	Impact Duration (Years)	Attribution to Project (%)	Net Social Value (THB)
S1.4 Ministry of Public Health Hospitals	Knowledge gains	Number of staff reporting increased knowledge; average reduction in staff time spent on coordination and follow-up	Standard speaker/trainer rate of THB 600 per hour, in accordance with the Ministry of Finance Regulation on Expenses for Training (No. 3) B.E. 2555 (Comptroller General's Department, 2012).	4 Years	40%	220,914.24
S1.4 Ministry of Public Health Hospitals	Reduced coordination time	Average reduction in hours spent on inter-agency coordination per month	Value of staff time saved, using the relevant public-sector staff time rate or standard professional rate adopted in the report	4 Years	70%	994,202.20
S1.4 Ministry of Public Health Hospitals	Reduced follow-up time	Reduction in administrative hours required for patient tracking and follow-up	Value of staff time saved, using the relevant public-sector staff time rate or standard professional rate adopted in the report	4 Years	100%	1,420,288.86
S1.6 Provincial Public Health Offices (PHOs)	Strengthened collaboration (PHO)	Number of joint initiatives, protocols, and collaborations implemented	Proxy value of network-strengthening / collaboration benefit (Cost of academic meeting organisation)	4 Years	60%	94,892.26
S4 External Partners (NGOs,	Strengthened collaborative networks	Number of partner organisations	Proxy value of strengthened partnership	4 Years	100%	158,153.76

Stakeholder Group	Material Outcome	Measurement Indicator	Financial Proxy (Valuation Basis)	Impact Duration (Years)	Attribution to Project (%)	Net Social Value (THB)
foundations, etc.)		evidencing stronger collaboration and sustained partnership value	(Cost of academic meeting organisation)			
Total Impact						99,828,493.43

Overall, the findings indicate that the project delivers substantial and sustained value at patient, family, institutional, and system-wide levels. Long-term benefits—particularly knowledge transfer, integrated care systems, and strengthened networks—extend beyond the project period and support ongoing improvements in Thailand's craniofacial care ecosystem. These findings support continued investment, scaling, and policy integration of coordinated digital health networks to strengthen patient-centred care nationwide.

2. OVERVIEW OF THE REPORT

This report will be presented in 7 Sections as follows:

Section 1: Establishing Scope and Identifying Stakeholders

Defines the purpose, scope, and users of the SROI assessment and identifies all key stakeholder groups involved in or affected by the project.

Section 2: Mapping Outcomes

Describes project inputs and links them to expected outputs and outcomes to illustrate how invested resources generate change.

Section 3: Evidencing Outcomes and Giving Them a Value

Verifies actual outcomes, determines their duration, and applies valuation and impact-adjustment methods to produce credible net outcome values.

Section 4: Calculating the Social Return on Investment (SROI)

Compares total discounted outcomes with total inputs to determine the SROI ratio, showing how much social value is created per unit of investment.

Section 5: Case Scenario / Sensitivity Analysis

Tests key assumptions under different scenarios to assess the robustness and reliability of the SROI results.

Section 6: Stakeholder Verification Process

This section outlines the steps taken to confirm the identity, legitimacy, and requirements of the individuals or groups involved in a project.

Section 7: Recommendations and Limitations

Provides actionable recommendations for future development and acknowledges limitations that may affect interpretation of the findings.

3. PROJECT IMPLEMENTATION DETAILS–AN OVERVIEW

Project: Sustainable Healthcare System driven by the Data from Functional Health Care Organizations and IT Platform of Network for Health Care Providers Implementation to Upper Northern Thailand

Project Details

This project is implemented by the Princess Sirindhorn IT Foundation Craniofacial Center, Chiang Mai University (SCFC). It focuses on developing a sustainable cleft lip-palate care system using data technology across eight provinces in Upper Northern Thailand during the 2023–2025 implementation period. The project integrates five main areas of operation: collaborative networks, data on business intelligence, information technology systems, research, and patient care service. It supports the development of linked patient databases, strengthens multidisciplinary collaboration, improves treatment continuity and follow-up, and promotes knowledge exchange between the Craniofacial Center and network hospitals. These activities are intended to improve the quality, coordination, and sustainability of care for patients with cleft lip, cleft palate, and craniofacial anomalies in the region.

Beneficiaries

1. Patients
2. Patients' families
3. Multidisciplinary teams working at Maharaj Nakorn Chiang Mai Hospital, Faculty of Medicine, Chiang Mai University; hospitals under the Ministry of Public Health; and Provincial Public Health Offices
4. Non-profit organisations and other external agencies

Key Activities

The project consists of five main operational areas:

1. **Cooperative Network** – Providing training, knowledge dissemination, multidisciplinary coordination, and network-building activities to strengthen collaboration across the eight provinces.

2. **Business Intelligence and Data Management** – Supporting the collection, organisation, analysis, and use of patient and service data for planning, monitoring, and follow-up care.
3. **Information Technology Systems and Thai Cleft Link Development** – Developing linked patient databases and digital systems to improve referral, treatment planning, continuity of care, and information exchange between hospitals.
4. **Patient Care Service** – Delivering multidisciplinary patient care, consultation, and relevant clinical support services.
5. **Research** – Conducting research using data generated by the Center and its network to improve services and support future innovation.

In addition, the project includes complementary initiatives and special activities, such as:

- Speech Camp for Children with Cleft Lip and/or Palate
- Pre-Speech Training for Occupational Therapists

Royal-initiative support activities and related patient support programmes

Expected Outcomes

Patients with cleft lip, cleft palate, and craniofacial anomalies will receive more timely, continuous, and coordinated care through a strengthened multidisciplinary service system across the eight provinces in Upper Northern Thailand. Improved patient databases and information technology systems will support more effective treatment planning, referral, follow-up, and coordinated scheduling, which may help reduce unnecessary hospital visits and improve continuity of care. Furthermore, knowledge exchange, collaborative activities, and capacity-building efforts will strengthen local multidisciplinary teams and improve the quality, efficiency, and responsiveness of patient care services throughout the regional network.

4. SOCIAL RETURN ON INVESTMENT APPROACH

This evaluation applies the Social Return on Investment (SROI) methodology to assess the economic, social, and environmental value generated by the project: “Sustainable Healthcare System driven by the Data from Functional Health Care Organizations and IT Platform of Network for Health Care Providers Implementation to Upper Northern Thailand.” The assessment covers the project’s 3-year implementation period (2023–2025) across eight provinces in Upper Northern Thailand and considers the value created through its five main areas of operation: collaborative networks, data on business intelligence, information technology systems, research, and patient care service. The approach is guided by the **Principles of SROI**, ensuring that stakeholder perspectives, material outcomes, transparency, and impact integrity are incorporated throughout the analysis. By translating social outcomes into monetary values, the SROI framework enables stakeholders to clearly quantify the social value created relative to the resources invested in the project. While the analysis is rooted in the Eight Principles of SROI to ensure rigor, the practical execution follows a systematic six-step process, as illustrated in Figure 1 below:

Figure 1 The Six-Step SROI Process

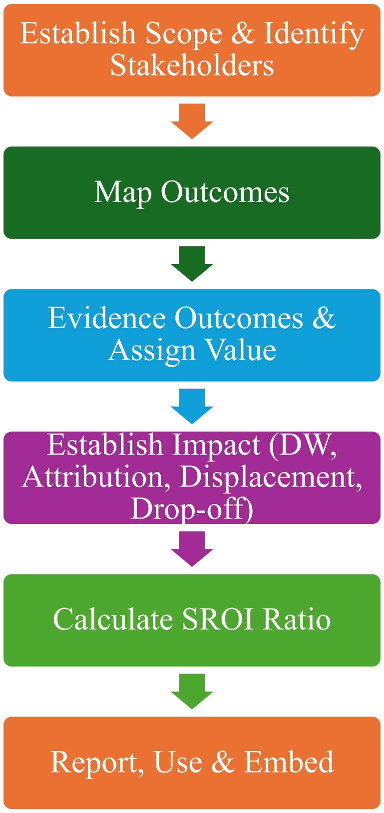


Figure 1 presents the six standard steps of the Social Return on Investment (SROI) methodology, illustrating the logical sequence from establishing scope and mapping outcomes to calculating and reporting the final impact. The assessment follows the standard SROI process as outlined below:

STEP 1: ESTABLISHING THE OBJECTIVES AND SCOPE

In alignment with the first principle of SROI—Involve Stakeholders—this initial phase defines the boundaries and goals of the evaluation to ensure that all material impacts are captured.

- **Primary Objective**: To evaluate the social, economic, and environmental impacts generated by the *Sustainable cleft lip-palate care system using data technology* project across the eight northern provinces of Thailand during the 2023–2025 implementation period.
- **Scope of Analysis**: The assessment covers both direct and indirect effects experienced by key stakeholder groups, including:
    - Patients and their families.
    - Multidisciplinary professional teams and provincial health authorities.
    - Non-profit partners and
    - the Princess Sirindhorn IT Foundation Craniofacial Center (SCFC).
- **Methodology & Data Collection**: To ensure a robust evidence base, the study utilized a mixed-methods approach:
    - **Qualitative Data**: 40 in-depth interviews and representative consultations with stakeholders to identify meaningful outcomes.
    - **Quantitative Data:** Analysis of administrative and clinical datasets provided by relevant health agencies and project partners.
    -

STEP 2: IDENTIFYING STAKEHOLDERS

In this stage, all individuals or organizations that experience significant change—whether positive or negative, intended or unintended—as a result of the project were identified. To ensure a comprehensive analysis, stakeholders were categorised into **eight primary groups:**

- **Patients**: Individual with cleft lip, cleft palate, and craniofacial conditions.
- **Families and caregivers**: Those providing primary support and experiencing indirect socio-economic impacts.
- **Maharaj Nakorn Chiang Mai Hospital:** Multidisciplinary teams directly involved in specialized clinical care.
- **Ministry of Public Health (MOPH) hospital teams**: Local medical staff across the network provinces.
- **Primary Care Units:** Subdistrict Health Promoting Hospitals and Village Health Volunteers (VHVs) responsible for community-level monitoring.
- **Provincial Public Health Offices:** Authorities overseeing regional health policy and coordination.
- **The Craniofacial Center, Chiang Mai University (SCFC):** The core implementing agency managing the IT platform and project operations.
- **External partners:** Non-profit organizations and other supporting agencies.

Stakeholder Engagement and Materiality

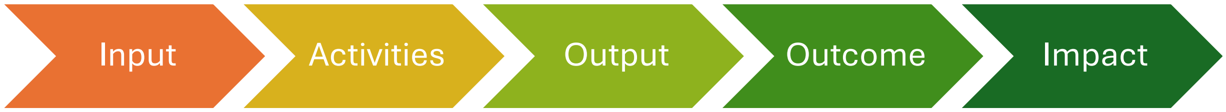
The involvement of these groups was essential to ensure that the outcomes identified for analysis reflect material, evidence-based changes that truly matter to those affected. This process safeguards the integrity of the SROI ratio by focusing only on significant impacts.

STEP 3: DEVELOPING THE IMPACT PATHWAY AND DATA COLLECTION

3.1 Impact Pathway Development

The **Impact Pathway** describes the logical chain through which project activities generate social value. It connects inputs and activities to the resulting outputs and, ultimately, to the longer-term outcomes and impacts experienced by stakeholders.

Figure 2 Impact Pathway



This pathway illustrates how clinical services, digital tools, capacity building, coordination mechanisms, and cross-institutional collaborations lead to meaningful improvements in health, wellbeing, and system performance across provinces.

3.2 Identifying Inputs

Inputs encompass all resources invested to make the project possible. These include financial resources, personnel time, medical treatment costs, surgical expenses, digital platform development, coordination mechanisms, and capacity-building investments.

3.3 Identifying Outputs

Outputs are the direct, tangible products of the project activities. Key outputs generated by the project include:

- patient care services provided through multidisciplinary treatment and follow-up,
- linked patient databases and information technology systems, including Thai Cleft Link,
- strengthened collaborative networks across hospitals and provincial public health offices,
- improved data and business intelligence for planning and monitoring, and
- research and knowledge generated from project operations.

3.4 Identifying Outcomes

In SROI, outcomes must describe the **actual change** experienced by stakeholders. Material outcomes identified from stakeholders include:

- **Improved Health Status:** Reduced physical complications and enhanced functional health for patients.
- **Enhanced Quality of Life:** Increased confidence and social integration for patients and reduced psychological stress for families.
- **Economic Stability:** Lowered long-term healthcare costs and travel burdens for families.
- **System Efficiency:** Reduced coordination time and improved data accuracy for healthcare providers.

STEP 4: MONETISING OUTCOMES

Monetising outcomes is essential for converting intangible social change—such as improved wellbeing, reduced stress, or increased system efficiency—into **financial values** that can be compared to project investment. This process allows for a standardized assessment of the total social value created.

The valuation process was conducted through the following steps:

- Selecting indicators that accurately reflect stakeholder-defined outcomes
- Applying appropriate financial proxies (market prices, shadow prices, replacement costs, unit-cost references, and research-based valuations)
- Calculating the value per person multiplied by actual beneficiaries

  Adjusting values using SROI impact factors: **Deadweight, Attribution, Displacement, and Drop-off** to ensure only the **net impact** attributable to the project is counted.

To maintain the integrity of the results, the valuation follows a conservative approach aligned with Social Value International (SVI) standards, ensuring that social value is not over-reported.

STEP 5: CALCULATING THE SROI RATIO

The SROI ratio was calculated using the standard formula:

$$\text{SROI} = \frac{\text{Total Present Value of Outcomes}}{\text{Total Investment Cost}}$$

This ratio indicates the amount of social value generated for every 1 Thai Baht invested in the programme.

STEP 6: REPORTING RESULTS AND IMPROVING THE PROGRAMME

The SROI findings are presented in a structured report that supports strategic decision-making, including:

- Clear communication of the social value generated
- Identification of areas for programme improvement
- Recommendations for enhancing efficiency, sustainability, and collaboration
- Evidence for resource allocation, policy advocacy, and potential expansion of the programme

5. BASIC INFORMATION OF THE SROI REPORT

Section 1: Establishing Scope and Identifying Stakeholders

Section 1.1: Establishing the Scope of the Assessment

Purpose of the Assessment

The purpose of this Social Return on Investment (SROI) assessment is to evaluate the economic and social impacts generated by The Princess Sirindhorn IT Foundation Craniofacial Center, Chiang Mai University (SCFC), during the project implementation period (2023–2025). The assessment measures the outcomes experienced by patients, families, medical personnel, and related agencies, and quantifies the value created from the investment. The results provide evidence to support policy decision-making, resource allocation, and strategic planning for the continuation or expansion of craniofacial care services.

Intended Users of the Assessment Results

- Chiang Mai University administrators
- Faculty of Medicine, Chiang Mai University
- Management of the Craniofacial Center
- Budget-supporting agencies and public health policymakers
- Government agencies and network partners, including Provincial Public Health Offices and hospitals under the Ministry of Public Health
- Relevant non-profit organisations and patient-support networks
- Stakeholders and future project developers who require evidence-based insights for programme improvement, scaling, and long-term planning

Scope of Project Activities Assessed

The assessment covers the main activities implemented under the project across the patient care pathway and regional service system, including patient care services, multidisciplinary coordination, development of collaborative networks, information technology systems, linked patient databases, data management, and research activities across the **eight provinces in Upper**

Northern Thailand. Both **direct and indirect effects** arising from these activities are captured to reflect the value created for beneficiaries and system-level stakeholders.

Implementation Boundary

This SROI analysis includes only the outcomes and stakeholders directly affected by the Sustainable Healthcare System driven by the Data from Functional Health Care Organizations and IT Platform of Network for Health Care Providers Implementation to Upper Northern Thailand activities and within the control or influence of the Craniofacial Center. Routine hospital operations, unrelated government health programmes, and external NGO activities not linked to the project are excluded from the assessment. Beneficiaries who did not participate in project services, as well as long-term social or economic effects that extend beyond the project's reasonable sphere of influence, are also considered outside the boundary. These boundaries ensure that the valuation reflects only the changes attributable to the project and avoids overstating its impact. To ensure a transparent and standardized valuation, the specific parameters regarding the analysis timeframe and investment totals are detailed in Table 1.

Table 1 SROI Analysis Period and Temporal Boundary

Parameter	Specification	Rationale
Project Implementation Period	2023 – 2025 (3 Years)	Represents the active funding and activity cycle for the Project.
Total Investment Basis	Cumulative (2023 – 2025)	total cumulative value of material inputs (THB 22,806,475.62) represent the full resource commitment over 3 years, not an annual average.
Value Creation Period	2023 – 2028 (Up to 6 Years)	Accounts for outcomes realized during the project and those persisting after completion (Duration).
Outcome Duration	1 – 4 Years	Varies by stakeholder; based on clinical evidence and stakeholder verification of how long benefits last.

Parameter	Specification	Rationale
Discounting Base Year	2023	All future values are discounted back to the start of the Project to reflect Present Value (PV).
Valuation Approach	Multi-year Evaluative	Uses actual performance data to calculate the total social return for the entire project lifecycle.

Discount Rate Applied

A discount rate of **3.5% per year** is applied in this assessment, following international guidelines and recommendations from HM Treasury's *Green Book* and public policy evaluation agencies. This reflects the present value of future benefits in an appropriate and standardised manner. Although Thailand does not prescribe a national social discount rate, 3.5% is considered appropriate because it avoids volatility associated with market interest rates and aligns with global public health and social impact evaluation standards. Alternative discount rates commonly used in practice (3% and 5%) were reviewed, and the SROI results remained robust, confirming that the selected rate is reasonable for this analysis.

Section 1.2: Stakeholder Identification

1.2.1 Stakeholder Identification Process

Stakeholders were identified through a comprehensive review of the documentation for the "*Sustainable Healthcare System driven by the Data from Functional Health Care Organizations and IT Platform of Network for Health Care Providers Implementation to Upper Northern Thailand*" project, the ThaiCleftLink database, and initial consultations with the project management team at the Craniofacial Center (SCFC).

To ensure no material group was excluded, the identification process also employed snowball sampling during the initial interviews. Interviewed stakeholders (e.g., hospital staff and families) were asked to identify other individuals or organizations contributing to the changes. This process confirmed the inclusion of community-level actors such as Village Health Volunteers (VHVs) and external non-profit partners.

To ensure that only stakeholders who truly experience the project's outcomes are included in the SROI assessment, specific **inclusion criteria** were established. These criteria align with the project's objectives and ensure materiality:

- **Geographic Scope:** Must be located within the project's designated areas (8 northern provinces).
- **Database Record:** Must be listed in the ThaiCleftLink database (for patients).
- **Direct Engagement:** Must have received services or participated directly in the treatment and care process

Stakeholder groups were then categorized according to their functional roles in the value chain:

- **Primary Beneficiaries:** Patients and Families.
- **Implementers / Service Providers:** Hospitals, Provincial Public Health Offices, medical and allied health professionals.
- **Supporters:** Funding organizations.
- **External Partners:** Relevant agencies involved in collaboration or coordination.

A structured stakeholder engagement process was undertaken to ensure that the outcomes and valuations reflected real experiences. Stakeholders were purposively selected across all groups, employing Stratified Purposive Sampling for the patient group to ensure diversity and analytical representativeness. The stratification was based on three key dimensions:

1. **Clinical Severity:** Distinguishing between patients with isolated cleft lip, cleft palate, and complex craniofacial deformities, as treatment pathways and care burdens differ significantly.
2. **Age Group:** Covering both early childhood (focusing on initial surgeries and development) and adolescence (focusing on speech therapy, orthodontics, and social integration).
3. **Financial Support Status:** Including beneficiaries with varying levels of financial aid to accurately assess the project's role in alleviating economic hardship compared to standard state support.

Engagement methods included individual interviews and small-group discussions, with **40 participants in total** (as detailed in Table 2). Insights from these sessions were used to identify material outcomes, validate impact assumptions, determine attribution percentages, and select financial proxies. This ensured that the SROI results were rooted in stakeholder evidence and aligned with SVI assurance requirements.

1.2.2 Stakeholder Groups

The key stakeholders identified and engaged are presented in Table 2.

Table 2 Stakeholder Groups and Consultation Numbers

Stakeholder Group	Total Population (Individuals/Units)	Number of Interviewed Participants	Method of Engagement
S1.1 Patients	2,643 persons	13 persons	In-depth Interview
S1.2 Patients' families	2,643 families	13 families	In-depth Interview
S1.3 Maharaj Nakorn Chiang Mai Hospital, Faculty of Medicine, CMU	89 persons	2 persons	Focus Group / Interview
S1.4 Ministry of Public Health Hospitals (55 units)	362 persons	2 persons	Focus Group / Interview
S1.5 Subdistrict Health Promoting Hospitals & Village Health Volunteers	12 persons	2 persons	Interview
S1.6 Provincial Public Health Offices (PHOs) (8 units)	30 persons	2 persons	Interview
S2.1 Craniofacial Center, Chiang Mai University (SCFC)	8 persons	3 persons	Interview
S4.1 Non-profit Organisations and external agencies – 3 units	3 organisations	3 persons	Interview

Note: The alphanumeric codes (e.g., S1.1, S1.2) are used as unique identifiers to strictly cross-reference each stakeholder group between this narrative report and the accompanying SROI Value Map (Excel calculation model). This ensures traceability of all inputs, outcomes, and valuations. For the external partner group, 3 organisations were consulted, with 1 representative interviewed from each organisation.

Table 2 presents an overview of the stakeholder engagement process, which was designed to comprehensively cover the entire care ecosystem. The stakeholders are categorized into four main groups:

1. **Primary Beneficiaries**: Patients and their families, who constitute the core focus of the project.
2. **Service Providers:** Ranging from specialized medical teams at the tertiary level (Maharaj Nakorn Chiang Mai Hospital) to the community health network, including Hospitals under the Ministry of Public Health, Subdistrict Health Promoting Hospitals, and Village Health Volunteers.
3. **System and implementation actors**, including Provincial Public Health Offices and staff of the Craniofacial Center (SCFC), who play key roles in coordination, implementation, and continuity of care
4. **Supporters**: Including Provincial Public Health Offices and external partner organizations.

This selection ensures that representatives from every relevant sector were engaged, facilitating data triangulation across multiple perspectives. However, given the high diversity within the patient and family populations, specific attention was paid to ensuring their representativeness. Consequently, a Stratified Purposive Sampling strategy was employed for these groups, the details of which are discussed in the following section.

To provide transparency regarding the scope of the analysis, **Table 3** offers a granular breakdown of the stakeholder groups. It explicitly defines the characteristics of each sub-group and outlines the strict **Inclusion and Exclusion Criteria** applied. These criteria serve as the primary filter for **Materiality**, ensuring that the SROI calculation incorporates only those individuals and units who experienced significant, attributable changes, while systematically excluding those with negligible or unrelated impacts to prevent overclaiming.

Table 3 Detailed Stakeholder List and Inclusion–Exclusion Criteria

Stakeholder Group	Sub-Group	Number	Stakeholder Characteristics	Inclusion–Exclusion Criteria
S1: Beneficiaries	**S1.1 Patients**	2,643 persons	Patients with cleft lip, cleft palate, and craniofacial deformities who receive treatment and follow-up care across the 8 northern provinces	**Include:** Patients recorded in the ThaiCleftLink database or who receive care from the Center **Exclude:** Patients not associated with the project or not receiving services within the 8 provinces
S1: Beneficiaries	**S1.2 Patients' families**	2,643 families	Primary caregivers responsible for transporting the patient, providing emotional support, and experiencing time and financial impacts	**Include:** Families of patients receiving treatment from the Center **Exclude:** Families not involved or not listed in the patient follow-up system

Stakeholder Group	Sub-Group	Number	Stakeholder Characteristics	Inclusion–Exclusion Criteria
S1: Beneficiaries Professional Collaborative Network (Multidisciplinary Teams)	**S1.3 Maharaj Nakorn Chiang Mai Hospital, Faculty of Medicine, CMU**	89 persons	Physicians, nurses, occupational therapists, speech-language pathologists, social workers, and other specialists involved in patient care	**Include:** Multidisciplinary staff directly providing treatment/follow-up **Exclude:** Staff not involved in patient care
S1: Beneficiaries Professional Collaborative Network (Multidisciplinary Teams)	**S1.4 Ministry of Public Health Hospitals**	55 units, 362 persons	Health professionals in community hospitals and medical Centers responsible for referral, care, and monitoring of patients	**Include:** MOPH hospitals in the 8 provinces participating in the project **Exclude:** Hospitals outside the project area
S1: Beneficiaries Professional Collaborative Network (Multidisciplinary Teams)	**S1.5 Subdistrict Health Promoting Hospitals (SHPH) and Village Health Volunteers (VHVs)**	12 persons	Local health staff and volunteers responsible for community-level patient follow-up	**Include:** Individuals directly involved in case follow-up **Exclude:** VHVs not involved with project patients

Stakeholder Group	Sub-Group	Number	Stakeholder Characteristics	Inclusion–Exclusion Criteria
S1: Beneficiaries Professional Collaborative Network (Multidisciplinary Teams)	**S1.6 Provincial Public Health Offices (PHOs)**	8 units, 30 persons	Coordinators of service systems between the Center and Ministry of Public Health hospitals	**Include:** PHO staff in the 8 participating provinces **Exclude:** Provinces outside the project's geographical scope
S2: Project Implementer	**S2.1 Craniofacial Center, Chiang Mai University**	1 unit	Medical teams, management, and staff responsible for the entire project implementation	**Include:** Staff with active operational roles **Exclude:** Personnel not involved in the project
S3: Supporters	**S3.1 Operation Smile Thailand**	1 unit	Provides funding, equipment, and supports activities such as Perfect Smile and 100 Smiles Mission	**Include:** Organisations funding treatment or related activities **Exclude:** Organisations not involved in funding

Stakeholder Group	Sub-Group	Number	Stakeholder Characteristics	Inclusion–Exclusion Criteria
S4: Related Agencies	**S4.1 Non-profit Organisations and other external agencies**	3 units	Partner organisations involved in activities, knowledge dissemination, or academic collaboration	**Include:** Agencies participating in academic events or network meetings **Exclude:** Agencies not directly linked to project outcomes

1.2.3 Patient and Family Subgroups and Representativeness (Stratified Sampling)

A specific analytical focus was placed on the Patient (S1.1) and Family (S1.2) stakeholder groups in order to ensure that the small qualitative sample (n=13 cases) captured meaningful variation within the wider beneficiary population of 2,643 patients/families.

The selection of the 13 interviewees was not random. Instead, the evaluation used stratified purposive sampling based on clinical and demographic data from the project database in order to achieve analytical representativeness rather than statistical representativeness. As detailed in the stakeholder analysis, participants were selected to reflect meaningful variation in **developmental stage** and **clinical complexity**, because these factors were expected to influence both the pathway of care and the type of outcomes experienced.

For the patient stakeholder group, subgroup identification was based on two analytical dimensions. The first was **developmental stage**, including: **(1) children aged 0–3 years,** representing the early intervention and primary surgical stage (focus on survival, nutrition, and initial repair); **(2) children aged 3–12 years,** representing the speech therapy and school-readiness stage; and **(3) patients age 12 years and above,** representing later-stage treatment, including orthodontic care, secondary revisions, and social confidence support.

The second was **Clinical complexity**, including: (1) **standard cleft lip and cleft palate cases,** which typically follow more defined surgical pathways, and (2) **complex craniofacial anomaly cases**, which often require more intensive multidisciplinary care and continuity of specialist support.

These subgroup categories were used not only to guide sampling, but also to support the later interpretation of how the form, emphasis, and practical significance of outcomes differed across developmental stages and levels of clinical complexity. For example, the needs of an infant requiring primary surgery differ materially from those of an adolescent requiring social support. Likewise, patients with more complex craniofacial anomalies may experience a different pathway of change from standard cleft cases because of their greater dependence on specialist coordination and sustained multidisciplinary care. Table 4 presents the specific subgroups included in the sample and the rationale for their selection based on the materiality of expected outcomes. To strengthen transparency regarding the wider beneficiary profile, administrative age-band and treatment-stage data were reviewed alongside the interview sample. These data indicate that, for analytical and valuation purposes, the wider patient population can be grouped into broader developmental-stage categories as follows: 0–3 years = 435 patients (16.46%), 3–12 years = 824 patients (31.18%), 12 years and above = 1,383 patients (52.33%), and unknown age = 1 case (0.04%), totalling 2,643 patients. These broader categories were consolidated from the project's treatment-stage data in order to better reflect the dominant form of change experienced at different stages of care and to support a more transparent link between subgroup analysis and later valuation.

In analytical terms, the purpose of introducing these wider population subgroups is not to imply that each age band experiences wholly separate outcomes, but rather to clarify that the emphasis, timing, and practical significance of outcomes differ across developmental stages. Earlier-stage patients are more closely associated with outcomes relating to continuity of care, feeding, speech development, and reduced developmental delays, whereas older patients are more strongly associated with outcomes relating to confidence, social participation, and longer-term adjustment in daily life. The intermediate 3–12 year group represents a transitional stage in which these forms of change may overlap.

For the family stakeholder group, an additional operational subgroup distinction was identified and retained for both interpretation and valuation purposes: families receiving travel compensation and families not receiving travel compensation. This distinction is important because the project affects the two groups differently in relation to travel burden, work absence, and the economic significance of time savings. Although the interview sample was designed to achieve analytical representativeness across key subgroups, it remains small relative to the full beneficiary population. The findings should therefore be interpreted as analytically informative and evidence-based, rather than statistically generalisable to all beneficiaries. This creates a risk that the scale and distribution of outcomes in the wider population may differ from those observed in the interviewed sample. In this evaluation, interviews with 13 patient/family cases were used primarily to identify and interpret subgroup-specific outcome patterns, while administrative and clinical records were used to validate those patterns and to support cautious scaling to the wider beneficiary population.

1.2.4 Analysis of Subgroup Outcomes

During the qualitative data analysis, the evaluation examined whether different patient and family subgroups experienced materially different forms, emphases, or pathways of change. The findings indicate that although the overall direction of change was broadly positive across the sample, the emphasis, pathway, and practical significance of outcomes were not identical across all subgroups. What differed was not only the intensity of change, but also the way in which change was experienced and prioritised by different stakeholders.

These differences were subsequently taken into account in the valuation model by allocating patient outcome quantities according to developmental-stage subgroup, rather than assuming equal scaling of all patient outcomes across the full beneficiary population. Among patients, subgroup differences were evident in the relative emphasis of outcomes. Earlier-stage and younger patients were more closely associated with continuity of care, feeding, speech development, and developmental progress. By contrast, older patients and those in later stages of treatment more often emphasised confidence, comfort in social interaction, and the ability to participate more normally in school and community life. In addition, patients with more complex craniofacial anomalies appeared to depend more heavily on specialist referral, sustained multidisciplinary support, and coordinated long-term follow-up. These differences do not imply that each subgroup experienced wholly separate or unrelated outcomes. Rather, they indicate that the pathway, timing, and emphasis of the valued outcomes differed across subgroups. In practical valuation terms, the 3–12 year subgroup was treated as transitional because this stage commonly includes overlapping forms of change. Some children in this age range were still primarily experiencing developmental and functional gains, while others were already demonstrating more visible changes in confidence, school participation, and social interaction. For this reason, the valuation model did not assume that all patients aged 3–12 experienced both outcomes equally. Instead, outcome quantities for this subgroup were allocated conservatively according to the dominant form of change evidenced in each case through triangulation of interview data, follow-up records, treatment-stage information, and activity participation records where available. This approach was adopted to avoid double-counting and to prevent the use of a single undifferentiated outcome assumption for a subgroup in which the pathway of change is inherently mixed.

Among families, a material subgroup distinction was identified between those receiving travel compensation and those not receiving travel compensation. Both groups reported reduced burden as a result of fewer unnecessary hospital visits, better coordination, and improved continuity of care. However, the magnitude and economic significance of the benefit differed between the two groups. Families without travel compensation faced a greater uncompensated burden in relation to travel costs, work absence, and time lost, while families receiving compensation still benefited from reduced visit frequency and lower time burden, but within a different support context. For this reason, this subgroup distinction is retained explicitly in both the narrative interpretation and the valuation structure.

Interpretation of the Overall Outcome: At a higher interpretive level, these subgroup-specific changes may all contribute to improved quality of life and a greater ability to live and participate more normally in society. In this report, however, Improved quality of life is retained only as an overarching interpretive impact and is not used as the basis for aggregation in the valuation model. The SROI calculation values only the specific material outcomes identified in the value map, namely reduced developmental delays, increased confidence and social participation, reduced parental stress and anxiety, and reduced travel/time burden. The valuation instead relies on specific, well-defined material outcomes identified in the value map, including reduced developmental delays, increased confidence and social participation, reduced parental stress and anxiety, and reduced travel/time burden. This distinction is important because subgroup differences should not be obscured by reference only to a shared ultimate outcome.

Conclusion on Segmentation: For the purposes of the SROI model, aggregation is applied only where the valued outcomes remain sufficiently comparable in both definition and valuation logic. This means that some subgroup differences are retained narratively to explain variation in the pathway and emphasis of change, while other subgroup distinctions are retained explicitly in the valuation structure where they materially affect the quantity or form of value created. The separation of family outcomes by travel compensation status is one such example. In addition, patient subgroup distinctions are also reflected in the valuation structure where developmental stage materially affects the primary form of value created. **In practical terms, earlier-stage and younger patients are linked primarily to outcomes relating to reduced developmental delays and developmental progress, whereas older patients and those in later stages of treatment are linked primarily to increased confidence and social participation**. Patient subgroups are therefore used not only as an interpretive and analytical structure, but also as a basis for allocating outcome quantities conservatively in the valuation model where the dominant form of change differs materially across developmental stages.

Valuation Rationale: The valuation therefore relies on outcome-specific financial proxies aligned with the material outcomes identified in the value map, such as reduced developmental delays, increased confidence and social participation, reduced parental stress and anxiety, and reduced travel/time burden. Aggregation is applied only where outcomes are sufficiently similar in their definition and valuation logic. Where developmental stage materially affects the dominant form of patient change, outcome quantities are allocated by subgroup rather than uniformly applied across the full patient population. This approach helps avoid overstating value by assuming that all patients experience the same primary outcome in the same proportion, while still allowing comparable outcomes to be aggregated where appropriate. The subgroup findings presented here are used to inform differentiated outcome interpretation and conservative allocation logic in the valuation model; they are not intended to imply that the exact same proportions or intensities of change apply uniformly across the full beneficiary population.

Consistency of Results within the Sample: Across the stratified sample, all interviewees reported meaningful positive change, and no respondents described a wholly neutral or negative overall experience. This supports the conclusion that the project generated value across the interviewed cases, while not implying that all members of the wider beneficiary population experienced identical forms or levels of change. However, because the sample is small relative to the wider eligible population, these findings should be interpreted as analytically informative rather than statistically conclusive. The application of these outcomes to the wider population therefore remains subject to conservative assumptions, explicit limitations, and sensitivity testing in later sections of the report.

These subgroup distinctions informed the later chain-of-events analysis in Section 2 and are carried forward into the valuation approach in Section 3, particularly through age-based allocation of patient outcomes and the explicit separation of family outcomes by travel compensation status. Although all interviewed cases reported meaningful positive change, this should not be interpreted as evidence that all members of the wider stakeholder population experienced identical outcomes or identical levels of change. In the wider population, some stakeholders may have experienced weaker change, different forms of change, or no material change within the observation period. For this reason, the findings are treated as analytically informative rather than statistically generalisable, and conservative assumptions are applied when scaling outcomes to the wider beneficiary population. This uncertainty is also tested through lower-uptake scenarios in the sensitivity analysis. The use of average figures and scaled outcome quantities also creates a risk that materially different experiences within a stakeholder group may be obscured if subgroup variation is not made explicit. In this evaluation, that risk was identified particularly among patient subgroups with different diagnoses and treatment pathways, and among family subgroups with different travel-compensation status. For example, patients with isolated cleft lip may experience the same broad direction of change as patients with cleft lip and palate or more complex craniofacial anomalies, but not necessarily with the same intensity, timing, or dependence on specialist support. Similarly, families receiving travel compensation may still experience reduced travel burden and work absence, but under a different economic context from families without compensation support. Where such differences were material, they were retained explicitly in the valuation structure or narrative interpretation, and conservative assumptions were applied when scaling outcomes to the wider population.

The subgroup findings presented here are based primarily on qualitative interviews with 13 patient/family cases, which were used to identify and interpret outcome patterns. Administrative and clinical records were then used to validate these patterns and to support cautious scaling in the later valuation model.

Table 4 Analytical Subgroups Included in the Patient Sample and Rationale for Inclusion

Analytical Subgroup	Representation in Interview Sample	Indicative Population Distribution	Why Included / Link to Material Outcomes
1. Early Childhood (0–3 Years)	Included (**n=2**)	**435 patients (16.46%)**	Represents patients in the early intervention, primary surgical, and early developmental stage. This subgroup was included because continuity of care, feeding support, timely treatment, and early speech and developmental progress are particularly relevant at this stage. It is linked primarily to the material outcome of **reduced developmental delays**, and secondarily to family outcomes such as **reduced parental stress and anxiety**.
2. Middle Childhood / School Age (3–12 Years)	Included (**n=2**)	**824 patients (31.18%)**	Represents patients in the school-age stage, including speech follow-up, oral assessment, dental care, and secondary revision. This subgroup was included because treatment and follow-up during this period are relevant to both **developmental functioning** and emerging **confidence and participation in school and social settings**. It is therefore treated as a **mixed or transitional subgroup** in the valuation logic.
3. Adolescents and Older Patients (12 Years and above)	Included (**n=2**)	**1,384 patients (52.33%)**	Represents patients in later-stage treatment, including orthodontic care, secondary revision, rhinoplasty, and psychosocial adjustment. This subgroup was included because it is particularly relevant to outcomes relating to **increased confidence and social participation**, as well as longer-term adjustment in daily life and community participation.
4. Specific Conditions (Cleft Lip / Cleft Palate / Cleft Lip-Cleft Palate)	Included (**n=4**) (**Cleft Lip = 2; Cleft Palate =** 2)	**2,278 patients (86.19%)**	Represents standard cleft cases with different treatment timelines and care needs. This subgroup was included to examine whether variation in diagnosis affected the care pathway and the relative emphasis of outcomes experienced by patients and families. These cases may experience the same broad direction of change, but not necessarily with the same timing, intensity, or dependence on specialist coordination.
5. Complex Craniofacial Anomalies (Craniofacial Disease / Syndromic Craniofacial Disease)	Included (**n=3**)	**365 patients (13.81%)**	Represents patients requiring more intensive, long-term, multidisciplinary management. This subgroup was included because complex cases may experience different pathways of change, with greater reliance on specialist referral, continuity of care, coordinated follow-up, and family support. The material outcomes may be similar in direction, but often differ in intensity and clinical pathway.

Analytical Subgroup	Representation in Interview Sample	Indicative Population Distribution	Why Included / Link to Material Outcomes
Total	**13 patients**	**2,643 patients (100.00%)**	The interview sample was designed to achieve **analytical representativeness** across key developmental and clinical subgroups, rather than statistical representativeness of the full patient population.

Note: The age-based and diagnosis-based subgroup categories are **analytical rather than mutually exclusive**. Individual interviewees may fall into both a developmental-stage subgroup and a diagnosis-based subgroup. The purpose of this table is to show how the patient sample was structured to capture variation in the **pathway, emphasis, and practical significance of material outcomes** across different types of cases. For wider-population interpretation, the developmental-stage distribution also provides a basis for later valuation logic: earlier-stage patients are linked primarily to **reduced developmental delays**, older patients are linked primarily to **increased confidence and social participation**, and the **3–12 year** group is treated as a **transitional subgroup** in which outcome emphasis may overlap.

Note on Gender Representativeness: Both male and female patients were included in the interview sample. However, gender was not used as a primary stratification criterion because the pathway of care and the material outcomes assessed in this study were expected to vary more substantially by developmental stage and clinical complexity than by gender. For this reason, subgroup construction prioritised treatment stage and condition-related differences.

Table 4A. Summary Profile of the 13 Interviewed Cases in Relation to the Wider Beneficiary Population

Profile Dimension	Wider Beneficiary Population / Available Project Data	Interview Sample Evidence	Relevance for Representativeness
Total beneficiary population	**2,643 patients** in the project database	**13 patient cases** and **13 family cases** were interviewed qualitatively	Shows that the interview sample was small relative to the wider beneficiary population and should therefore be treated as **analytically informative rather than statistically representative**.
Developmental-stage distribution	Administrative age-band and treatment-stage data indicate that the wider patient population can be consolidated into broader developmental groups of **0-3 years = 435 patients (16.46%)**, 3–**12 years = 824 patients (31.18%)**, **12 years and above = 1,383 patients (52.33%)**, and **unknown age = 1 case (0.04%)**.	Confirmed in **Table 4** through intentional inclusion of early childhood, middle childhood / school-age, and adolescent / older-patient cases.	Demonstrates that the interview sample intentionally included different developmental stages likely to influence both the **pathway of care** and the **dominant form of outcomes** experienced by patients and families.
Age-related outcome emphasis	In the wider beneficiary population, earlier-stage patients are more strongly associated with needs relating to early intervention, feeding, speech, and developmental progress, while older patients are more strongly associated with psychosocial adjustment, confidence, and social participation.	Reflected in the qualitative findings reported in Section 1.2.4, where subgroup differences were observed in the emphasis and practical significance of outcomes.	Supports the decision to interpret patient outcomes by **developmental-stage subgroup**, rather than assuming that all patient outcomes scale equally across the full beneficiary population.
Disease / diagnosis distribution	Cleft Lip-Cleft Palate = 1,158 (43.76%), Cleft Palate = 568 (21.47%), Cleft Lip = 552 (20.86%), Craniofacial disease = 334 (12.62%), and Syndromic craniofacial disease = 34 (1.29%).	The interview sample intentionally included both **standard cleft cases** and **complex craniofacial anomalies**.	Shows that the qualitative sample was designed to reflect **clinically meaningful variation**, although diagnosis-based population shares should not be interpreted as direct sample proportions.

Profile Dimension	Wider Beneficiary Population / Available Project Data	Interview Sample Evidence	Relevance for Representativeness
Clinical complexity / condition	The wider system includes both standard cleft conditions and more complex craniofacial cases requiring more intensive multidisciplinary care.	Confirmed in **Table 4**: **Specific Conditions** = 4 cases; **Complex Craniofacial Anomalies** = 3 cases.	Demonstrates that the sample included both more routine and more complex care pathways, helping the analysis capture variation in treatment burden, continuity of care, and reliance on specialist coordination.
Family travel-support status	The wider family population includes both families who received travel/time compensation and those who did not.	In the interview data, both travel-support contexts were represented and later treated as analytically important in valuation.	This is materially important because the **form and magnitude of travel burden, work absence, and time savings** differ between families receiving compensation and those not receiving compensation.
Province distribution	Patients were served through a regional network covering **eight provinces in Upper Northern Thailand**. The wider beneficiary population was geographically distributed across the regional care network, with Chiang Mai accounting for 40.48% of patients, followed by Chiang Rai (14.89%), Lamphun (6.06%), Mae Hong Son (5.90%), Phayao (5.33%), Lampang (5.29%), Phrae (2.09%), and Nan (1.56%).	Province-level distribution of the 13 interview cases was not fully documented case-by-case in the current report.	Provides important geographical context for the wider network. However, because care is delivered through an integrated regional referral and follow-up system, province is more relevant to service coverage and access than to materially different patient outcomes.
Treatment-stage variation	Population-level treatment-stage data are partially reflected through administrative age-band groupings and service records.	Partially evidenced through developmental-stage subgrouping and qualitative descriptions of early intervention, active treatment, and later-stage care.	Treatment-stage variation is conceptually addressed and is materially relevant to outcome emphasis, although a more explicit population-level treatment-stage summary would further strengthen transparency.

Profile Dimension	Wider Beneficiary Population / Available Project Data	Interview Sample Evidence	Relevance for Representativeness
Socio-economic diversity	Although direct household-level socio-economic status was not available, travel-compensation status serves as a practical indicator of differences in financial burden and support context. This is relevant because families receiving compensation are likely to face greater difficulty absorbing travel-related costs, which affects the interpretation of travel- and time-related outcomes.	Not yet fully documented case-by-case in the current report.	Socio-economic variation is relevant to **outcome intensity**, especially for family burden, but remains only partially evidenced in the current version.
Response variability	Not applicable at population level in a statistical sense.	Reflected in Section 1.2.4, which reports that the overall direction of change was broadly positive, but that the **emphasis, pathway, and practical significance of outcomes** differed across subgroups.	Indicates that meaningful qualitative variation was observed, although more explicit case-level reporting would improve transparency.
Gender coverage	Not summarised in the population profile used here.	The report confirms that both male and female patients were included, although gender was not used as a primary stratification criterion.	Supports basic diversity of the sample, but gender was not treated as a primary analytical subgroup because developmental stage and clinical complexity were expected to matter more for outcome differences.

Note: Table 4A combines evidence from the interview sample, administrative patient data, and the subgroup framework used in the valuation logic to show how the **13 interviewed patient cases** relate to the wider beneficiary population. The table shows that the sample was intentionally structured to capture variation in **developmental stage**, **clinical complexity**, and **family support context**, rather than to mirror the wider population statistically. In particular, the wider beneficiary profile confirms that different age groups represent materially different stages of treatment and care, which is important because earlier developmental stages are linked more strongly to **reduced developmental delays**, while later stages are linked more strongly to **increased confidence and social participation**. The **3–12 year** group remains a transitional subgroup in which outcome emphasis may overlap.

To strengthen transparency regarding the small qualitative sample, **Table 4A** relates the 13 interviewed patient cases to the wider beneficiary profile available from the project database and the subgroup structure used in the analysis. The table shows that the sample was designed to capture meaningful variation in **developmental stage**, **diagnosis**, and **family support context**, while the wider population data confirm substantial variation in age-related treatment stages and clinical pathways. At the same time, the report recognises that the sample remains small relative to the full beneficiary population. For this reason, the findings are interpreted as **evidence-informed and analytically useful rather than statistically generalisable**, and conservative assumptions are applied when scaling outcomes to the wider beneficiary population.

1.2.5 Data Saturation

Despite the relatively small qualitative sample of 13 patient/family cases, thematic saturation was achieved in relation to the material outcomes identified for this evaluation. By the final interviews in each subgroup, no new material outcomes or significant negative effects were being identified, confirming that the sample was sufficient to construct a robust Theory of Change for the population. However, saturation in this context should be understood as saturation of qualitatively identified themes and material outcomes within the sampled subgroups, rather than evidence of statistical representativeness for the wider beneficiary population. The finding that no new material outcomes were emerging supports the robustness of the Theory of Change, but it does not remove uncertainty regarding the precise scale, distribution, or intensity of outcomes in the wider beneficiary population. This distinction is important for interpreting the later valuation and sensitivity analysis. In this evaluation, interviews with 13 patient/family cases were used primarily to identify and interpret material outcome patterns across subgroups, while administrative and clinical records were used to validate those patterns and to support cautious scaling to the wider beneficiary population.

Section 1.3 Materiality Assessment and Justification

The assessment applied SROI's materiality principle to determine which stakeholders and outcomes should be included in the valuation. Materiality was assessed based on the scale of the change experienced, the relevance to project objectives, and evidence of measurable outcomes.

1.3.1 Criteria for Assessing Outcome Materiality

To ensure a rigorous selection process, the project team evaluated all identified outcomes based on two primary dimensions: Relevance (Qualitative) and Significance (Quantitative). The specific criteria used to determine inclusion or exclusion are summarized below:

1. Relevance (Qualitative Assessment)

- **Stakeholder Priority:** The outcome was explicitly identified and valued by stakeholders during in-depth interviews (e.g., reduced stress for families).
- **Strategic Alignment:** The outcome aligns with the core objectives of the Sustainable Healthcare System project and the mission of the Craniofacial Center.

2. Significance (Quantitative Assessment)

- **Scale (Quantity):** The number of stakeholders experiencing the change. Outcomes affecting a large proportion of the beneficiary group (e.g., all 2,643 families) were prioritized over isolated incidents.
- **Duration:** The persistence of the benefit. Outcomes with lasting impact (e.g., developmental gains lasting 4 years) were considered more material than temporary or transient effects.
- **Value (Magnitude):** The relative worth of the outcome. Outcomes that generated substantial social value or cost savings (e.g., avoided medical costs) were included.
- **Causality (Attribution):** The strength of the causal link. Outcomes were included only if there was clear evidence that the project contributed significantly to the change (High Attribution), as opposed to changes driven primarily by external factors (Deadweight).

In addition, materiality was assessed not only at the overall stakeholder-group level, but also at the **subgroup level** where the **form, emphasis, or quantity of outcomes** differed materially across the beneficiary population. For the patient stakeholder group in particular, developmental stage and clinical complexity were considered analytically important because these factors influenced both the pathway of care and the dominant form of value created. This means that outcome materiality was interpreted with attention to **variation within the patient population**, rather than assuming that all patients experienced the same primary outcomes in the same proportion.

1.3.2 Stakeholder Materiality and Exclusion Rationale

The project applied a structured materiality test based on scale, relevance to core objectives, evidence strength, and stakeholder priority. For the patient stakeholder group, materiality was not treated as uniform across all beneficiaries. While patients were retained as a material stakeholder group overall, the evaluation also recognised that the **dominant outcome emphasis varied across developmental-stage subgroups**. As a result, the materiality of patient outcomes was interpreted in a differentiated way, with earlier-stage patients more strongly linked to developmental outcomes and older patients more strongly linked to confidence and social participation outcomes. Outcomes for SHPH/VHV were excluded due to inconsistent evidence, limited scale of follow-up effects, and stakeholder confirmation that these changes were secondary rather than primary outcomes. It is important to note that the exclusion of certain stakeholder groups (e.g., VHVs, General Public) was not based solely on external assumptions. As shown in Table 2, representative interviews were conducted with these groups to assess materiality directly. Only after confirming through these engagements that outcomes were immaterial or inconsistent did the project team decide to exclude them from the valuation (as detailed in Table 5).

Table 5 summarises the inclusion/exclusion decisions and their justifications.

Table 5 Stakeholder Identification and Rationale for Inclusion/Exclusion

Stakeholder Group	Key Outcomes Identified	Included in SROI?	Materiality Justification
S1.1 Patients	Reduced developmental delays; increased confidence and social participation	**Yes**	Outcomes are central to project objectives and strongly evidenced by interviews, clinical pathways, and administrative data. Materiality is further supported by the **large scale of beneficiaries** and by the finding that the **dominant form of change differs across developmental-stage subgroups**, with earlier-stage patients more closely associated with developmental progress and later-stage patients more closely associated with confidence and social participation.
S1.2 Families of Patients	Reduced stress and anxiety; reduced travel/time burden	**Yes**	Families experience the highest share of social value (60.54%); measurable and strongly linked to project activities.
S1.3 Maharaj Nakorn Chiang Mai Hospital, Faculty of Medicine, CMU	Pride; better teamwork; improved coordination	**Yes**	Directly attributable to network strengthening; affects service quality; validated through staff interviews.

Stakeholder Group	Key Outcomes Identified	Included in SROI?	Materiality Justification
S1.4 Ministry of Public Health (MoPH) Hospitals within the Eight Northern Provinces	Knowledge gained; reduced coordination time	**Yes**	Affects continuity of care; measurable time savings support inclusion.
S1.5 Subdistrict Health Promoting Hospitals (SHPHs) and Village Health Volunteers (VHVs)	Improved follow-up capacity	**Excluded from valuation**	Contribution exists but outcomes are small-scale and inconsistent; insufficient evidence for valuation.
S1.6 Provincial Public Health Offices (PHOs) in the Eight Northern Provinces	Stronger provincial networks	**Yes**	PHOs play a system-level coordinating role; outcome is critical for long-term sustainability.
S2.1 Craniofacial Center, Faculty of Medicine, Chiang Mai University	Enhanced institutional reputation	**Yes**	Strong evidence through funding continuity and increased collaborations; directly linked to the project.

Stakeholder Group	Key Outcomes Identified	Included in SROI?	Materiality Justification
S3.1 Operation Smile Thailand	Increased mission impact; partnership value	**Excluded from valuation**	Important partner but outcomes are strategic rather than direct social impact; difficult to measure reliably.
S4.1 Non-profit Organisations, Academic Partners, and External Agencies Participating in the Project Network	Academic collaboration; network engagement	**Yes**	Small benefit but directly tied to project activities; evidence from event participation.
General public / non-patient CMU departments	General awareness	**No**	No measurable or significant outcomes within project timeframe.

Only stakeholders with substantial, measurable, and directly attributable outcomes—such as patients, families, healthcare teams, hospitals, PHOs, and the Craniofacial Center—are included in the SROI. Groups with limited evidence or indirect benefits, such as SHPHs/VHVs, Operation Smile Thailand, and the general public, are excluded to ensure materiality and avoid overclaiming.

1.3.3 Outcome Materiality Determination

Following the identification of material stakeholder groups in Table 5, the project team reviewed the 'List of Outcomes' derived from stakeholder interviews.' This process aimed to screen and determine which outcomes were sufficiently material to be included in the valuation, and which should be excluded or merged with other outcomes, as detailed in Table 6.

Table 6 Outcome Materiality Matrix

Stakeholder Group	Outcome Identified	Decision	Materiality Rationale (Relevance & Significance)
S1.1 Patients	Reduced developmental delays	Included	Material because it is strongly relevant to patients in the earlier stages of treatment and development, particularly those requiring timely intervention, feeding support, and speech-related follow-up. The outcome is strongly aligned with stakeholder priorities and is supported by the developmental-stage subgroup analysis.
S1.1 Patients	Increased confidence and social participation	Included	Material because it is strongly relevant to later-stage patients, especially those experiencing psychosocial adjustment, school/community participation, and confidence-related change. The outcome is strongly evidenced in the qualitative data and is consistent with subgroup differences observed across developmental stages.

Stakeholder Group	Outcome Identified	Decision	Materiality Rationale (Relevance & Significance)
S1.1 Patients	Improved physical appearance (e.g., facial structure, speech articulation)	Merged	While highly relevant, stakeholders described physical changes as the "driver" or intermediate step leading to the ultimate value of "Social Confidence." Therefore, it is merged into the chain of events rather than valued separately to avoid double-counting.
S1.1 Patients	Improved academic performance	Excluded	Although potentially relevant to some school-age patients, the evidence remained anecdotal and insufficiently robust for direct valuation. In this analysis, the more material and better-evidenced patient outcomes were retained as developmental progress and confidence/social participation, rather than academic performance as a separate valued outcome.
S1.2 Families	Initial confusion or difficulty using the digital application	Excluded	Identified as a negative outcome during initial implementation. However, stakeholders confirmed these issues were "temporary," "minor," and resolved quickly with staff support. The impact was deemed immaterial.
S1.2 Families	Reduced household debt	Excluded	While families experienced reduced financial burdens, the direct measurable change was "avoided travel costs and lost wages." "Debt reduction" is influenced by many external factors (attribution issues) and was not chosen as the primary indicator.

Stakeholder Group	Outcome Identified	Decision	Materiality Rationale (Relevance & Significance)
S1.5 SHPH & VHVs	Increased confidence & pride in providing specialized care	Excluded	Stakeholders confirmed this outcome exists (Relevance: High). However, the evidence was inconsistent across the group, and the scale of impact was secondary compared to the primary beneficiaries. Excluded to ensure a conservative valuation.
S3.1 Operation Smile	Achieved strategic goals & donor trust	Excluded	These are crucial "Strategic Benefits" for the funder but are not classified as social outcomes for beneficiaries in this SROI analysis. Excluding them prevents double-counting of the financial input provided.
General Public	Increased general awareness of cleft conditions	Excluded	While the project engaged in PR activities, 'Increased Awareness' implies a change in understanding, not necessarily a material change in behavior or well-being. Without evidence of subsequent action (e.g., increased referrals from the public), this outcome is deemed immaterial for valuation.

In addition to the outcomes included in the final valuation, the evaluation explicitly considered whether any other material outcomes—positive, negative, intended, or unintended—had arisen from the activity. Based on stakeholder engagement, administrative review, and the materiality screening process, no additional outcomes were identified that were both sufficiently evidenced and sufficiently significant to justify inclusion in the SROI valuation. Outcomes not taken forward were either merged into other valued outcomes to avoid double-counting, treated as intermediate or contextual effects, or excluded because their scale, evidence base, or causal link to the project was not strong enough.

Section 2: Mapping Outcomes

Section 2.1: Theory of Change and Outcome Pathway

2.1.1 Overview of the Value Creation Chain (Narrative Summary)

The project generates social value through a systematically linked chain of change:

- **Inputs** include financial capital from Operation Smile Thailand professional expertise from multidisciplinary teams, digital infrastructure, institutional coordination, and stakeholder time invested in treatment, follow-up, and network participation.
- **Activities** include clinical treatment and follow-up care, development and use of the ThaiCleftLink digital platform, training and capacity-building for network hospitals, referral coordination, family support, and inter-agency collaboration.
- **Outputs** include patients receiving treatment and continuity of care, trained healthcare personnel, multidisciplinary teams operating across eight provinces, functioning referral and follow-up systems, and an operational patient information database.
- Intermediate changes **then emerge from these outputs**. Clinical care and coordinated specialist support improve developmental progress and strengthen the conditions for greater confidence and social participation among patients. The digital platform and coordination network reduce fragmented care, unnecessary hospital visits, family time burden, work absence, and administrative inefficiencies within the care system.
- **Material outcomes** are therefore observed across patient development, patient confidence and social participation, family stress reduction, saved travel time and reduced work absence, professional capability, service coordination, follow-up continuity, institutional credibility, and network strengthening.

At a broader level, these changes contribute to overarching impacts such as improved quality of life, a stronger and more equitable craniofacial care system, reduced healthcare burden, a more sustainable digital health ecosystem, and greater social inclusion. For the **patient stakeholder group**, the value creation chain should not be interpreted as implying that all patients experience the same dominant form of change in the same proportion. In line with the subgroup analysis presented in **Section 1.2.4**, the emphasis of patient outcomes differs across **developmental stages**. Earlier-stage patients are linked more strongly to **reduced developmental delays**, whereas older patients are linked more strongly to **increased confidence and social participation**. The **3–12 year** group is treated as a **transitional subgroup** in which the emphasis of outcomes may overlap. This distinction is analytically important because it informs the later valuation logic and helps avoid overstating impact by assuming uniform outcome scaling across the full patient population.

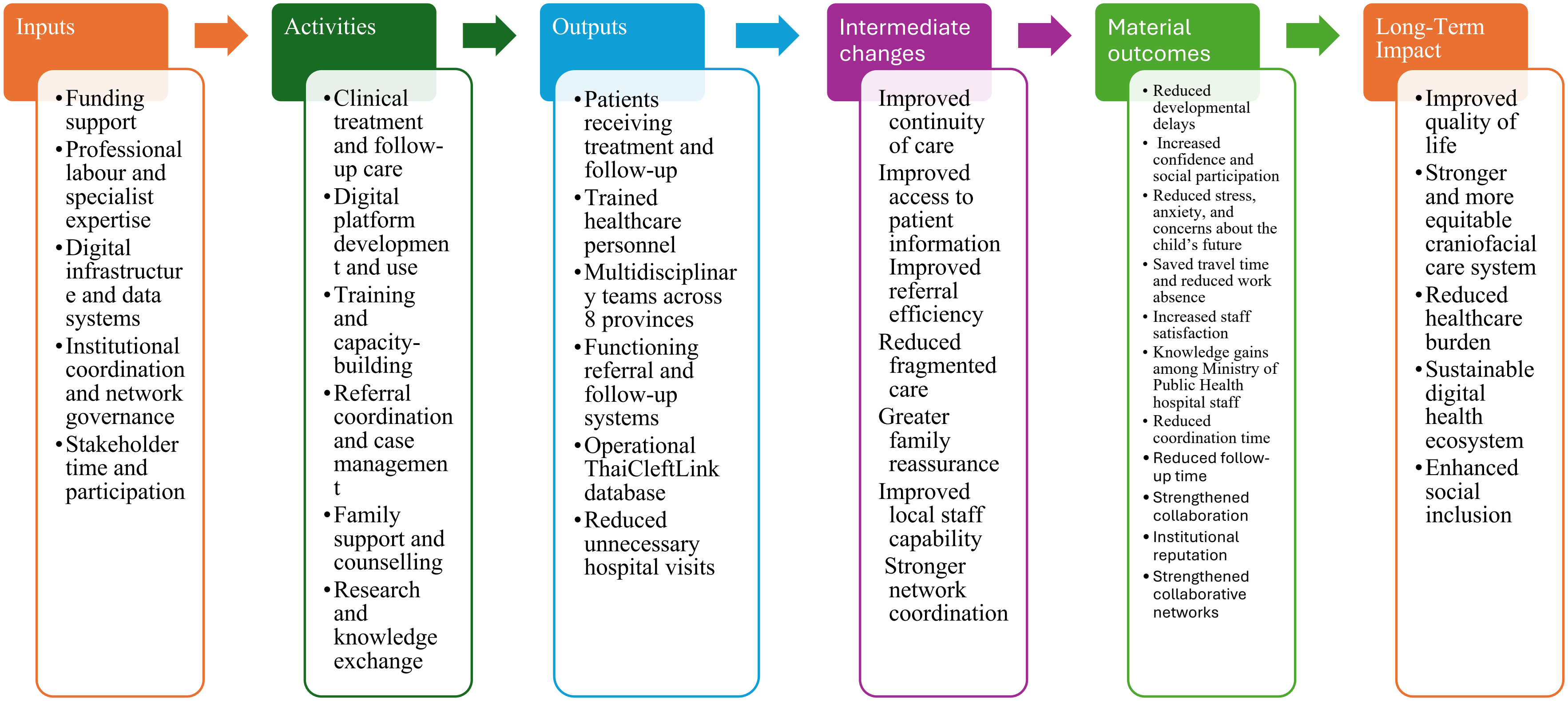
2.1.2 The Impact Pathway Model

Figure 3 illustrates the project's Theory of Change by mapping how invested resources lead to material outcomes and broader long-term impacts. Inputs such as funding, professional labour, digital systems, and patient participation enable activities including clinical treatment, digital platform development, training, coordination, and research. These activities generate outputs such as enrolled patients, trained staff, multidisciplinary teams, operational databases, and reduced hospital visits.

As a result, outcomes emerge across patient development, family well-being, health system efficiency, workforce skills, and institutional reputation. Ultimately, these changes contribute to the long-term impact of improved quality of life for patients, a stronger and more equitable craniofacial care system, reduced healthcare burden, a sustainable digital health ecosystem, and enhanced social inclusion. In this report, these broader changes are treated as overarching interpretive impacts, while the SROI valuation is based only on the specific material outcomes identified in the value map and the later outcome tables. This distinction is methodologically important. Broader concepts such as improved quality of life and enhanced social inclusion are retained as overarching interpretive impacts to explain the ultimate significance of the project, but they are not directly monetised as stand-alone outcomes in the SROI calculation. Instead, the valuation is anchored in more specific and evidencable material outcomes that can be more clearly defined, measured, and linked to defensible financial proxies. This helps reduce the risk of conceptual over-aggregation and double-counting. In addition, the patient pathway includes important **subgroup differences** by developmental stage and clinical complexity. The same broad chain of change may be observed across the patient population, but the **timing, emphasis, and**

practical significance of outcomes differ across earlier-stage, school-age, and later-stage patients. For this reason, the pathway model should be interpreted as a common framework for value creation, while the later valuation applies more differentiated logic to specific patient outcomes where the dominant form of change varies materially across subgroups.

Figure 3 Impact Pathway of Sustainable Healthcare System driven by the Data from Functional Health Care Organizations and IT Platform of Network for Health Care Providers Implementation to Upper Northern Thailand



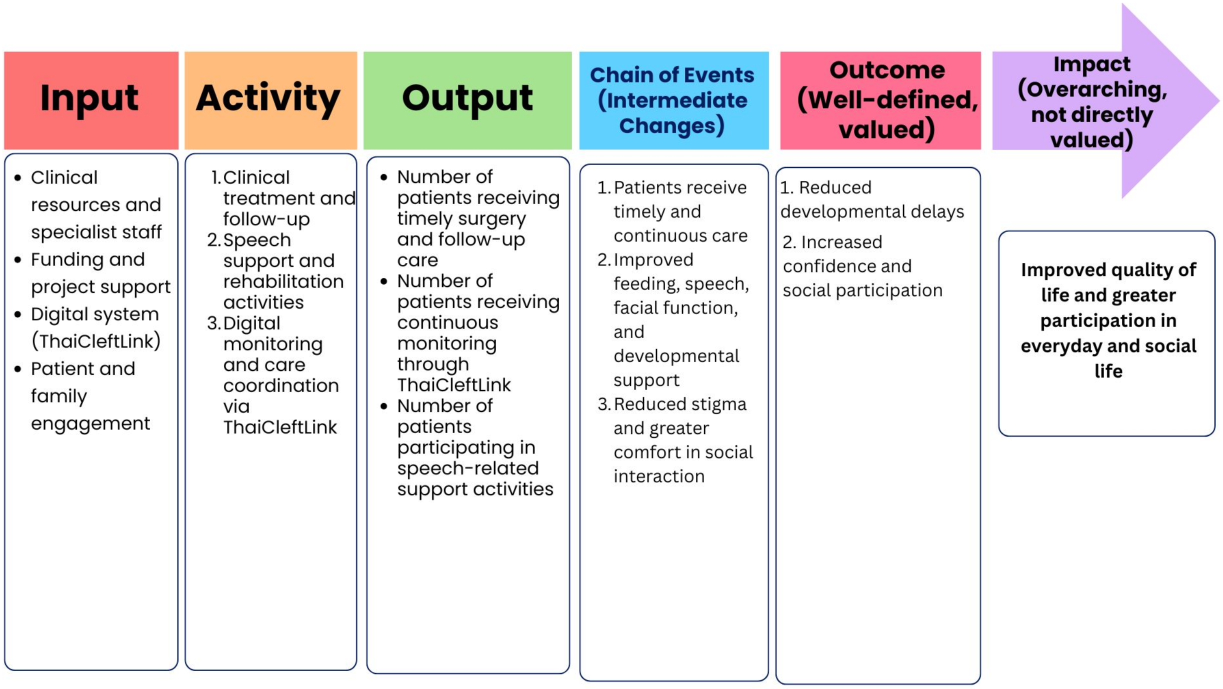
2.1.3 Detailed Chain of Events by Stakeholder

To comply with SVI Principle 2 (Understand what changes), this section details the causal link between project activities and the material outcomes experienced by key stakeholders. The following figures present the detailed "Chain of Events" for each stakeholder group. Each figure explains how project inputs and activities generated outputs, how these outputs created intermediate changes, and which specific material outcome was taken forward for valuation. These causal pathways were developed from stakeholder interviews, project implementation records, administrative and clinical evidence, and the professional judgement of the evaluators. Intermediate changes are shown to provide context, while only the clearly defined material outcomes identified in the value map were selected for valuation in order to avoid double-counting.

The following chains of events were developed from stakeholder interviews, project implementation records, administrative and clinical evidence, and the professional judgement of the evaluators. They are intended to show how activities plausibly led to intermediate changes and material outcomes for each stakeholder group.

Figure 4 Chain of Events for Stakeholder: S1.1 Patients

Connection between clinical/support activities and improved development/confidence



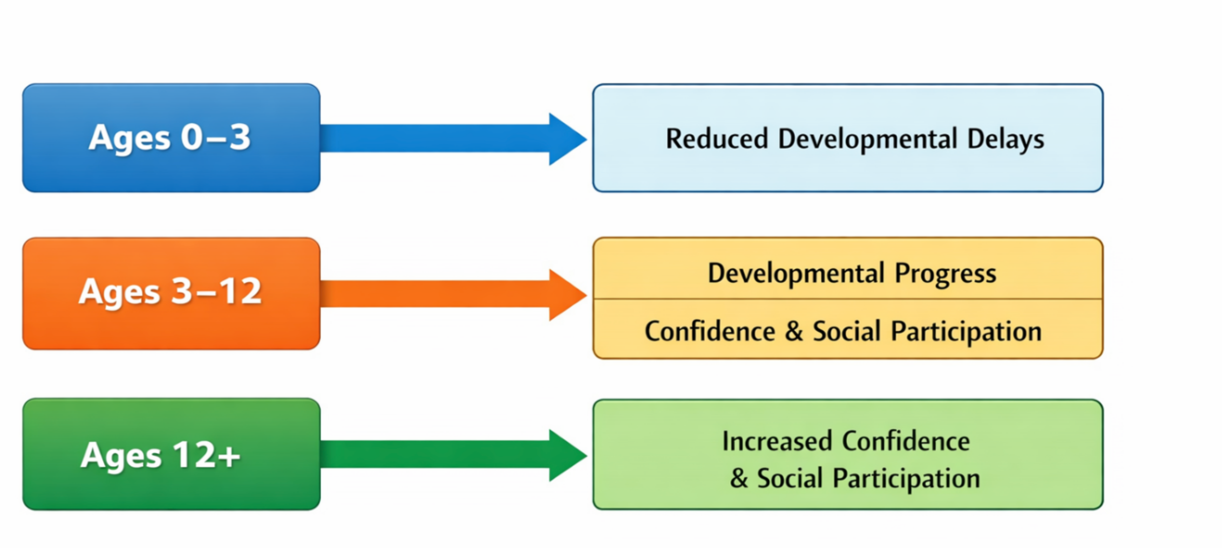
Input	Activity	Output	Chain of Events (Intermediate Changes)	Outcome (Well-defined, valued)	Impact (Overarching, not directly valued)
• Clinical resources and specialist staff • Funding and project support • Digital system (ThaiCleftLink) • Patient and family engagement	1. Clinical treatment and follow-up 2. Speech support and rehabilitation activities 3. Digital monitoring and care coordination via ThaiCleftLink	• Number of patients receiving timely surgery and follow-up care • Number of patients receiving continuous monitoring through ThaiCleftLink • Number of patients participating in speech-related support activities	1. Patients receive timely and continuous care 2. Improved feeding, speech, facial function, and developmental support 3. Reduced stigma and greater comfort in social interaction	1. Reduced developmental delays 2. Increased confidence and social participation	**Improved quality of life and greater participation in everyday and social life**

Note: In this figure, improved quality of life is presented as an overarching interpretive impact. The SROI valuation is based only on the two specific material outcomes shown in the outcome column and retained for valuation. For valuation purposes, the two material outcomes shown in this figure are not assumed to apply equally across the full patient population. In line with the subgroup findings presented in Section 1.2.4, earlier developmental stages are linked primarily to reduced developmental delays, whereas later stages are linked primarily to increased confidence and social participation. The 3–12 year group is treated as a transitional subgroup in which the dominant form of change may overlap.

Stakeholder: S1.1 Patients

The chain of events for patients begins with access to timely clinical treatment, coordinated follow-up care, and support activities such as speech-related programmes. These interventions improve continuity of care and provide better support for feeding, speech development, facial function, and overall developmental progress. As treatment outcomes become more visible, patients may also experience reduced stigma and greater comfort in social interaction, particularly in school and community settings. Together, these intermediate changes contribute to the two material outcomes of valuation: **reduced developmental delays,** and **increased confidence and social participation**. These two material outcomes are retained because they reflect meaningful and recurring forms of value identified by stakeholders; however, they are **not interpreted as uniformly dominant across all patient subgroups**. In the earlier stages of care, the pathway is more strongly associated with feeding support, timely treatment, speech development, and **reduced developmental delays**. In later stages of treatment, especially where psychosocial adjustment becomes more salient, the pathway is more strongly associated with **increased confidence and social participation**. Accordingly, the later valuation model applies this patient pathway with reference to **developmental-stage subgroup differences**, rather than scaling both patient outcomes equally across the full beneficiary population. At a broader level, these outcomes may contribute to improved quality of life and greater participation in everyday and social life.

Figure 4A Age-Based Outcome Allocation Logic for Patient Stakeholders

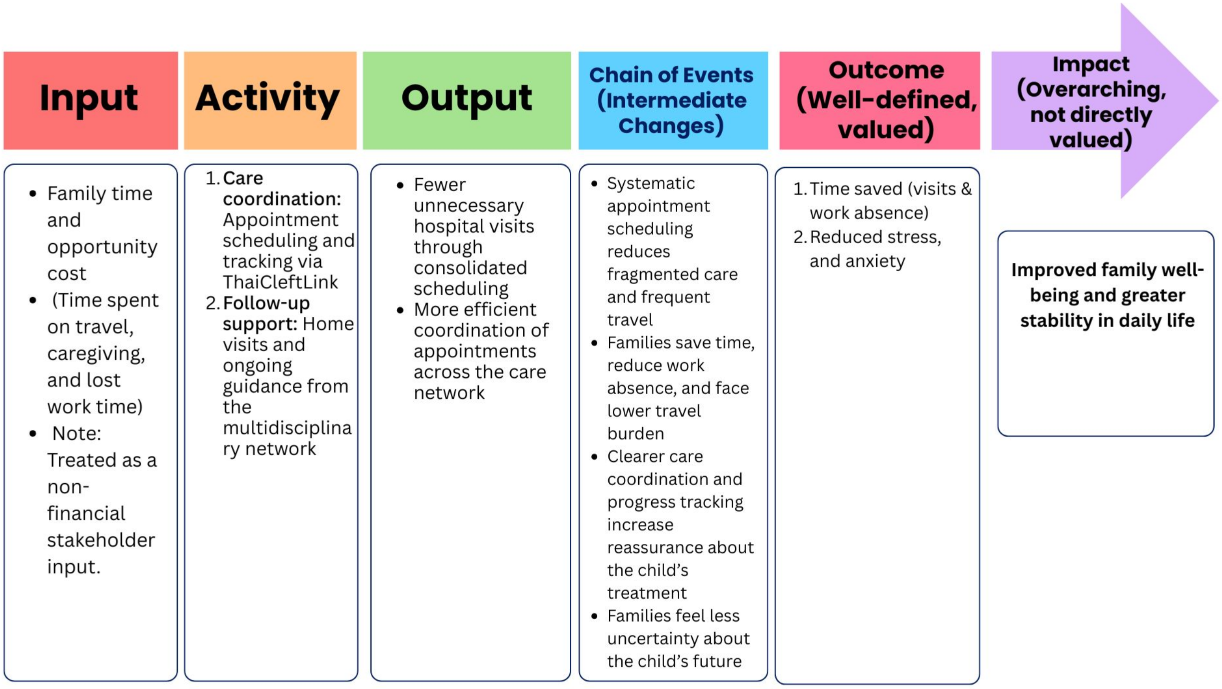


Note: Allocation is based on dominant form of change evidenced from interviews, follow-up records, and activity records.

Figure 4A illustrates how the dominant form of material patient outcomes retained for valuation differ across developmental stages. Earlier-stage patients are linked primarily to reduced developmental delays, older patients are linked primarily to increased confidence and social participation, and the 3–12 year group is treated as a transitional subgroup in which outcome emphasis may overlap. The figure 4A is intended to clarify the age-based logic used for conservative outcome allocation in the valuation model.

Figure 5 Chain of Events for Stakeholder: S1.2 Patients' Families

Connection between the digital platform/network and reduced burden/stress.



Input	Activity	Output	Chain of Events (Intermediate Changes)	Outcome (Well-defined, valued)	Impact (Overarching, not directly valued)
• Family time and opportunity cost • (Time spent on travel, caregiving, and lost work time) • Note: Treated as a non-financial stakeholder input.	1. **Care coordination:** Appointment scheduling and tracking via ThaiCleftLink 2. **Follow-up support:** Home visits and ongoing guidance from the multidisciplinary network	• Fewer unnecessary hospital visits through consolidated scheduling • More efficient coordination of appointments across the care network	• Systematic appointment scheduling reduces fragmented care and frequent travel • Families save time, reduce work absence, and face lower travel burden • Clearer care coordination and progress tracking increase reassurance about the child's treatment • Families feel less uncertainty about the child's future	1. Time saved (visits & work absence) 2. Reduced stress, and anxiety	**Improved family well-being and greater stability in daily life**

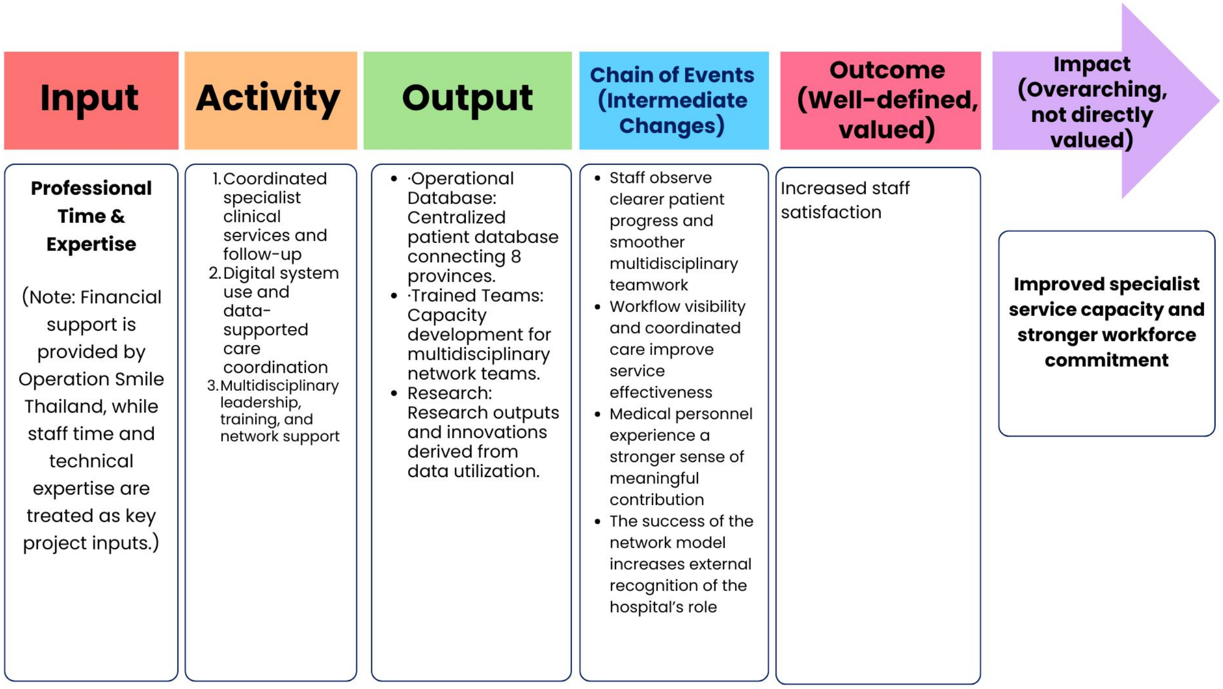
Note: In this figure, improved family well-being is presented as an overarching interpretive impact, while the SROI valuation is based on the two specific material outcomes shown in the outcome column and retained for valuation. Operational subgroups: families receiving travel compensation and families not receiving travel compensation.

Stakeholder: S1.2 Patients' Families

For patients' families, the integration of the ThaiCleftLink digital platform, coordinated appointment scheduling, and follow-up support creates two related pathways of change. First, improved coordination reduces fragmented care and unnecessary hospital visits, which lowers travel burden, saves time, and reduces work absence for caregivers. Second, clearer information about the child's treatment progress and better continuity of care increase reassurance about the future and reduce uncertainty. Together, these changes lead to two material outcomes retained for valuation: (1) **time saved from fewer hospital visits and reduced work absence, and (2) reduced stress, anxiety, and concerns about the child's future.** At a broader level, these outcomes may contribute to improved family well-being and greater stability in daily life.

Although both family subgroups experienced the same type of outcome—saved travel time and reduced work absence—the two groups were retained separately in the valuation structure because the form and magnitude of the burden avoided differed between families who received travel/time compensation and those who did not. The outcome is therefore conceptually the same, but the subgroup context and quantity logic are different. In valuation terms, this means that the report does not treat all family time savings as economically identical. The same broad outcome category is retained for conceptual clarity, but quantity scaling and interpretation are adjusted to reflect the different burden contexts of compensated and uncompensated families. This allows the analysis to preserve comparability of outcome type while still recognising a material difference in the practical significance of the burden avoided.

Figure 6 Chain of Events for Stakeholder: S1.3 Maharaj Nakorn Chiang Mai Hospital
Connection between digital innovation/networking and professional satisfaction/institutional reputation.

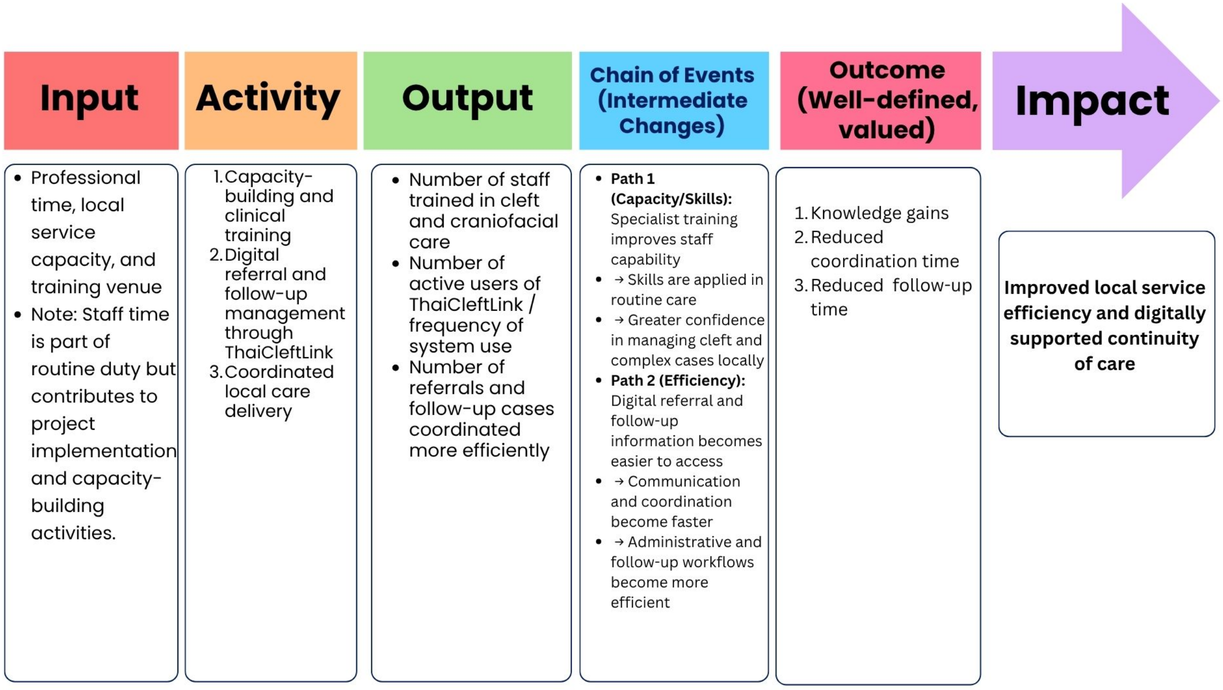


Input	Activity	Output	Chain of Events (Intermediate Changes)	Outcome (Well-defined, valued)	Impact (Overarching, not directly valued)
Professional Time & Expertise (Note: Financial support is provided by Operation Smile Thailand, while staff time and technical expertise are treated as key project inputs.)	1. Coordinated specialist clinical services and follow-up 2. Digital system use and data-supported care coordination 3. Multidisciplinary leadership, training, and network support	- ·Operational Database: Centralized patient database connecting 8 provinces. - ·Trained Teams: Capacity development for multidisciplinary network teams. - Research: Research outputs and innovations derived from data utilization.	- Staff observe clearer patient progress and smoother multidisciplinary teamwork - Workflow visibility and coordinated care improve service effectiveness - Medical personnel experience a stronger sense of meaningful contribution - The success of the network model increases external recognition of the hospital's role	Increased staff satisfaction	**Improved specialist service capacity and stronger workforce commitment**

Stakeholder: S1.3 Maharaj Nakorn Chiang Mai Hospital & Faculty of Medicine

For Maharaj Nakorn Chiang Mai Hospital, the project creates value through coordinated specialist clinical services, digital system use, and multidisciplinary leadership within the regional care network. These activities improve workflow visibility, strengthen continuity of care, and make the results of coordinated treatment more visible to staff. As medical personnel observe clearer patient progress and more effective teamwork, they experience a stronger sense of meaningful contribution, leading to the material outcome of increased professional pride and fulfilment. The success of the network model may also strengthen institutional recognition; however, this is better treated as a contextual effect rather than the primary valued outcome in order to avoid overlap with the Craniofacial Center’s institutional outcome.

Figure 7 Chain of Events for Stakeholder : S1.4 Ministry of Public Health Hospitals
Connection between capacity building/digital tools and increased skills/efficiency.



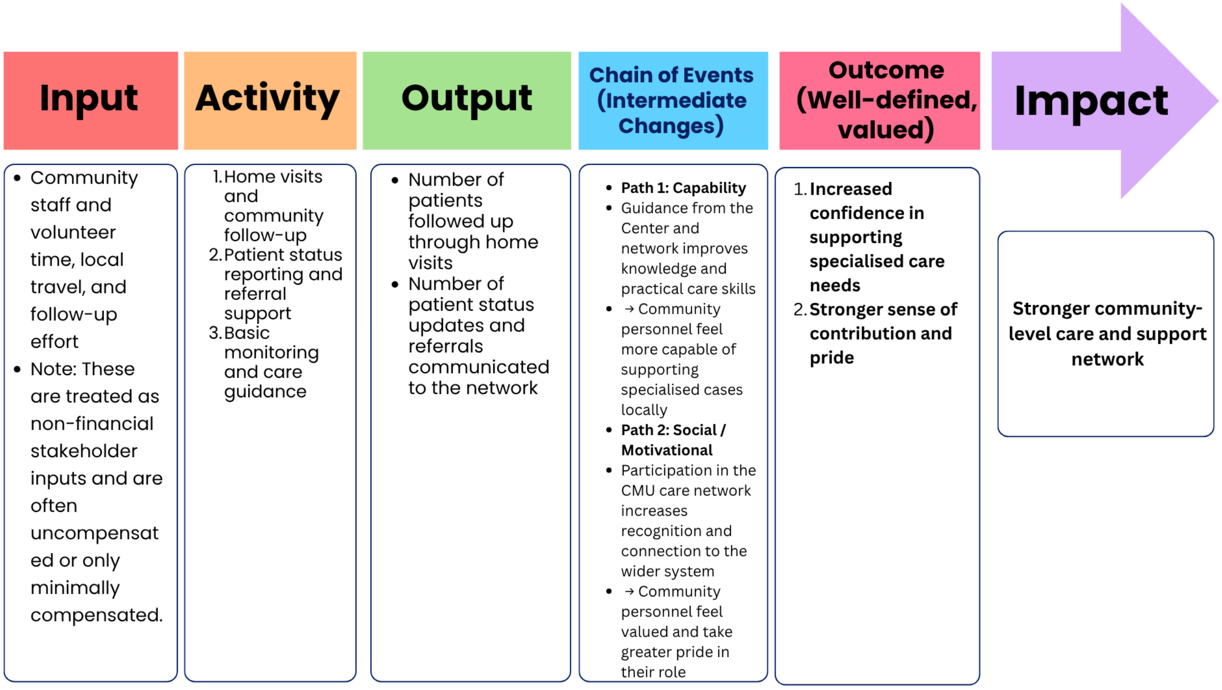
Input	Activity	Output	Chain of Events (Intermediate Changes)	Outcome (Well-defined, valued)	Impact
• Professional time, local service capacity, and training venue • Note: Staff time is part of routine duty but contributes to project implementation and capacity-building activities.	1. Capacity-building and clinical training 2. Digital referral and follow-up management through ThaiCleftLink 3. Coordinated local care delivery	• Number of staff trained in cleft and craniofacial care • Number of active users of ThaiCleftLink / frequency of system use • Number of referrals and follow-up cases coordinated more efficiently	• **Path 1 (Capacity/Skills):** Specialist training improves staff capability • → Skills are applied in routine care • → Greater confidence in managing cleft and complex cases locally • **Path 2 (Efficiency):** Digital referral and follow-up information becomes easier to access • → Communication and coordination become faster • → Administrative and follow-up workflows become more efficient	1. Knowledge gains 2. Reduced coordination time 3. Reduced follow-up time	**Improved local service efficiency and digitally supported continuity of care**

Stakeholder: S1.4 Ministry of Public Health (MoPH) Hospitals

For Ministry of Public Health hospitals, capacity-building, digital referral management through ThaiCleftLink, and coordinated local care delivery strengthen both staff capability and service efficiency. Training and case-based learning improve the knowledge and practical skills of hospital staff, increasing their confidence in managing cleft and complex cases locally. At the same time, easier access to referral and follow-up information streamlines communication and reduces duplication in coordination and patient monitoring. Together, these changes lead to three material outcomes retained for valuation: (1) increased knowledge and practical capability among hospital staff, (2) reduced coordination time, and (3) reduced follow-up time.

Figure 8 Chain of Events for Stakeholder : S1.5 Subdistrict Health Promoting Hospitals (SHPH) and Village Health Volunteers (VHVs)

Connection between community-level monitoring and enhanced local capacity.

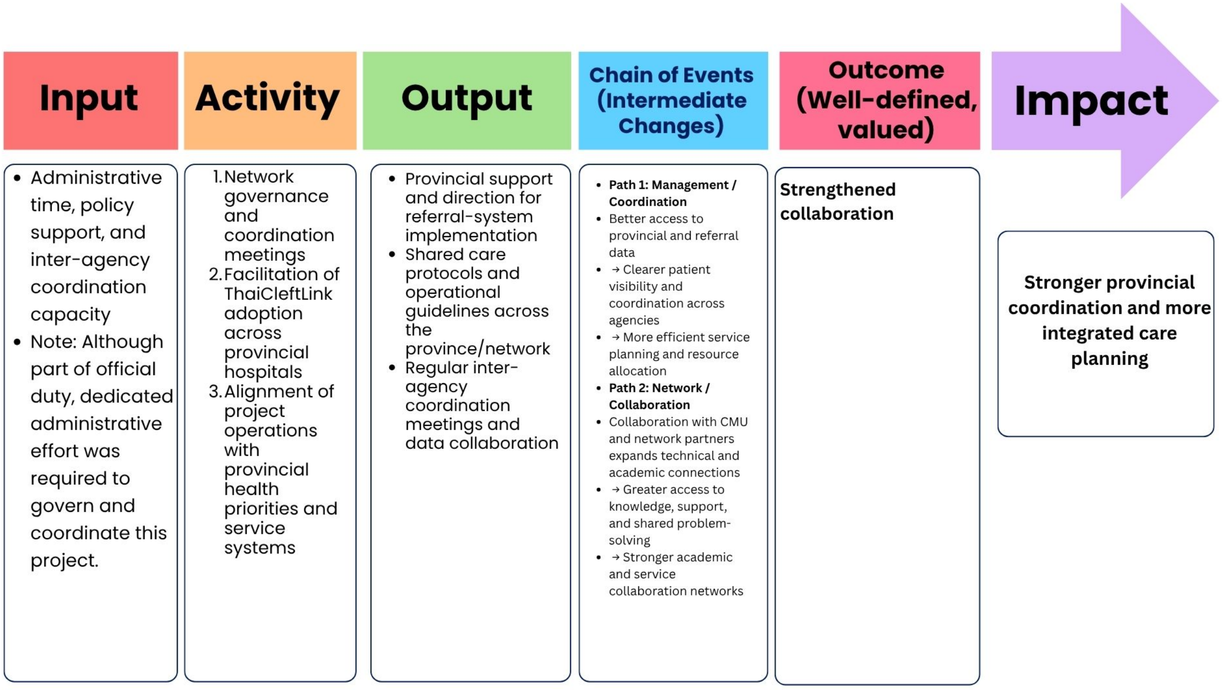


Note on Valuation: Although outcomes for S1.5 SHPHs and VHVs were identified as positive (Increased Confidence & Pride), **they were not monetized in this SROI calculation** to maintain a conservative approach. The analysis prioritizes material outcomes for primary beneficiaries (patients and families), and excludes this group to avoid overclaiming due to the variable nature of the evidence.

Stakeholder: S1.5 Subdistrict Health Promoting Hospitals (SHPH) & Village Health Volunteers (VHVs)

For Subdistrict Health Promoting Hospitals (SHPH) & Village Health Volunteers (VHVs), home visits, community follow-up, patient status reporting, and referral support strengthen the connection between local care providers and the wider specialist network. Guidance from the Center and ongoing engagement in the care system improve practical knowledge and increase confidence in supporting specialised care needs at community level. At the same time, participation in the network strengthens recognition of their role and creates a stronger sense of contribution and pride. These positive changes support a stronger community-level care and support network, although they are retained as contextual effects and are not monetised in this SROI calculation.

Figure 9 Chain of Events for Stakeholder : S1.6 Provincial Public Health Offices (PHOs) Connection between network governance and strengthened health systems.

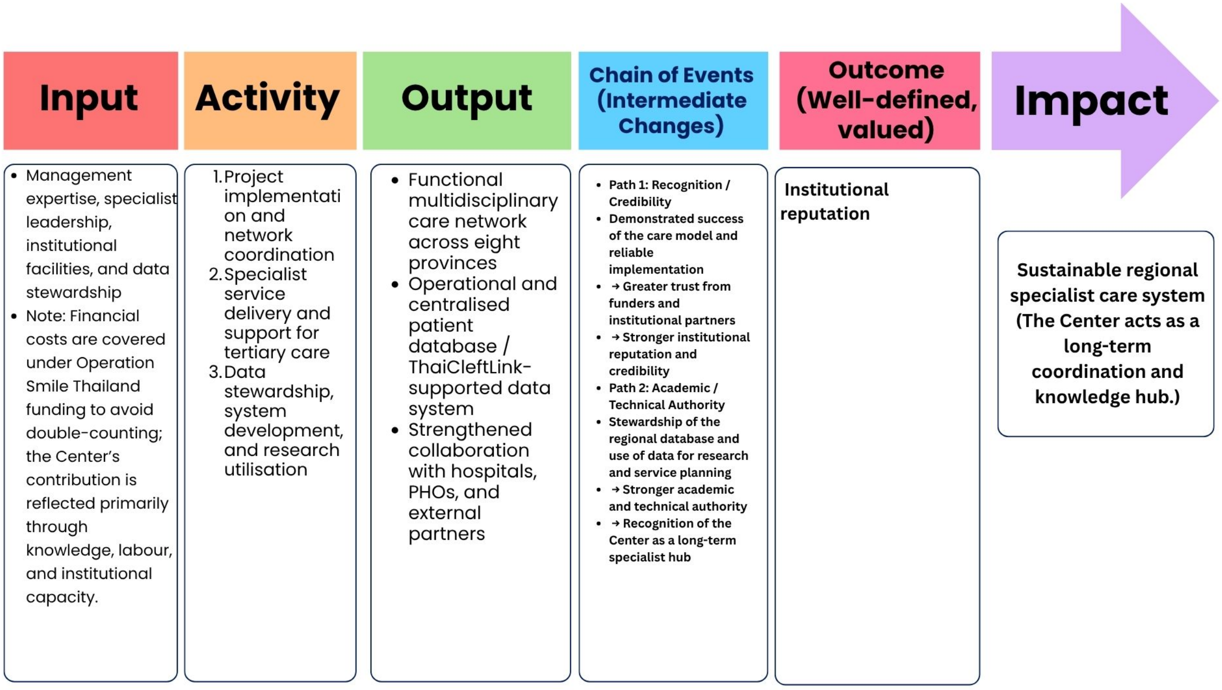


Input	Activity	Output	Chain of Events (Intermediate Changes)	Outcome (Well-defined, valued)	Impact
• Administrative time, policy support, and inter-agency coordination capacity • Note: Although part of official duty, dedicated administrative effort was required to govern and coordinate this project.	1. Network governance and coordination meetings 2. Facilitation of ThaiCleftLink adoption across provincial hospitals 3. Alignment of project operations with provincial health priorities and service systems	• Provincial support and direction for referral-system implementation • Shared care protocols and operational guidelines across the province/network • Regular inter-agency coordination meetings and data collaboration	• **Path 1: Management / Coordination** • Better access to provincial and referral data • → Clearer patient visibility and coordination across agencies • → More efficient service planning and resource allocation • **Path 2: Network / Collaboration** • Collaboration with CMU and network partners expands technical and academic connections • → Greater access to knowledge, support, and shared problem-solving • → Stronger academic and service collaboration networks	**Strengthened collaboration**	**Stronger provincial coordination and more integrated care planning**

Stakeholder: S1.6 Provincial Public Health Offices (PHOs)

For Provincial Public Health Offices, administrative coordination, policy support, and network governance help align referral processes, data systems, and service planning across hospitals and partner agencies. By facilitating adoption of ThaiCleftLink and supporting shared protocols and regular coordination meetings, PHOs improve access to provincial and referral data, strengthen patient visibility, and support more efficient planning and resource allocation. At the same time, collaboration with Chiang Mai University and other network partners expands technical and academic connections. Together, these changes lead to the material outcome retained for valuation: strengthened collaboration networks across provincial and inter-agency health services.

Figure 10 Chain of Events for Stakeholder : S2.1 Craniofacial Center, Chiang Mai University Connection between project success and institutional sustainability.

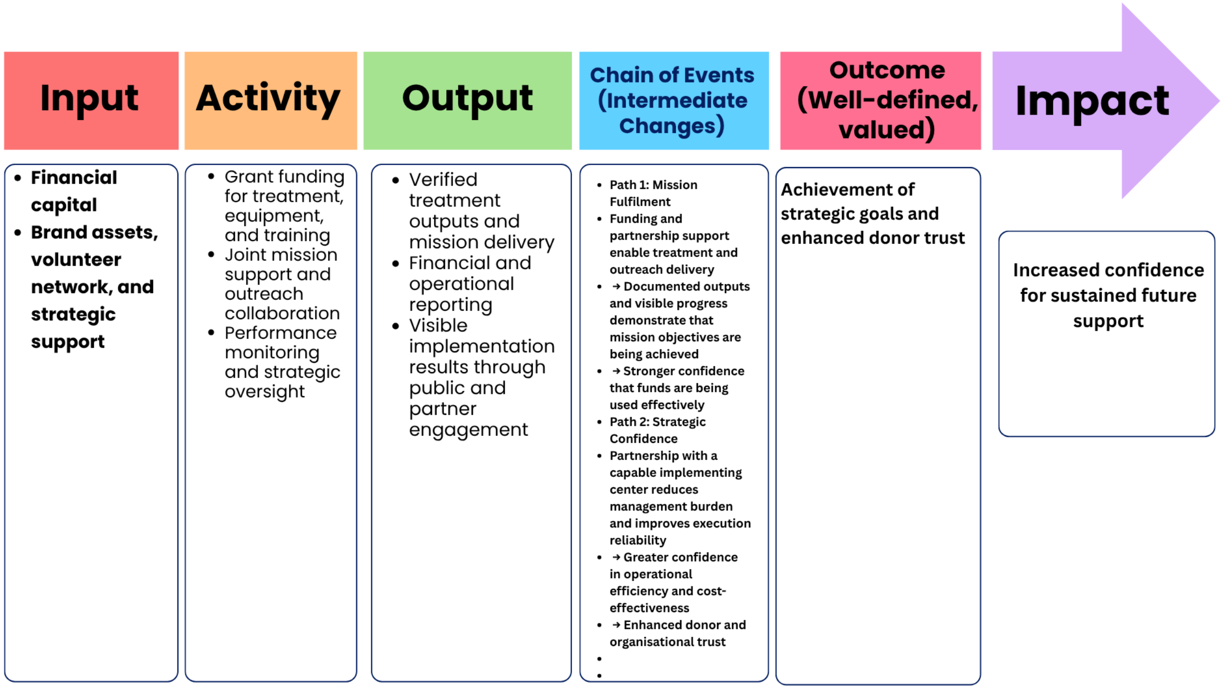


Input	Activity	Output	Chain of Events (Intermediate Changes)	Outcome (Well-defined, valued)	Impact
• Management expertise, specialist leadership, institutional facilities, and data stewardship • Note: Financial costs are covered under Operation Smile Thailand funding to avoid double-counting; the Center's contribution is reflected primarily through knowledge, labour, and institutional capacity.	1. Project implementation and network coordination 2. Specialist service delivery and support for tertiary care 3. Data stewardship, system development, and research utilisation	• Functional multidisciplinary care network across eight provinces • Operational and centralised patient database / ThaiCleftLink-supported data system • Strengthened collaboration with hospitals, PHOs, and external partners	• Path 1: Recognition / Credibility • Demonstrated success of the care model and reliable implementation • → Greater trust from funders and institutional partners • → Stronger institutional reputation and credibility • Path 2: Academic / Technical Authority • Stewardship of the regional database and use of data for research and service planning • → Stronger academic and technical authority • → Recognition of the Center as a long-term specialist hub	Institutional reputation	Sustainable regional specialist care system (The Center acts as a long-term coordination and knowledge hub.)

Stakeholder: S2.1 Craniofacial Center, Chiang Mai University (Project Implementer)

For the Craniofacial Center, management expertise, specialist leadership, institutional support, and stewardship of the regional data system enable the implementation of a functioning multidisciplinary care network across the upper northern region. Through project coordination, specialist service delivery, and the development and use of ThaiCleftLink and related databases, the Center demonstrates reliable implementation capacity and builds stronger collaboration with hospitals, PHOs, and external partners. These activities increase trust from funders and institutional partners, while also strengthening the Center's academic and technical authority. Together, these intermediate changes lead to the material outcome retained for valuation: enhanced institutional reputation and credibility, reflected in increased budget allocation and recognition of the Center as a long-term specialist hub.

Figure 11 Chain of Events for Stakeholder: S3.1 Operation Smile Thailand (Main Supporter) Connection between funding and mission fulfillment.



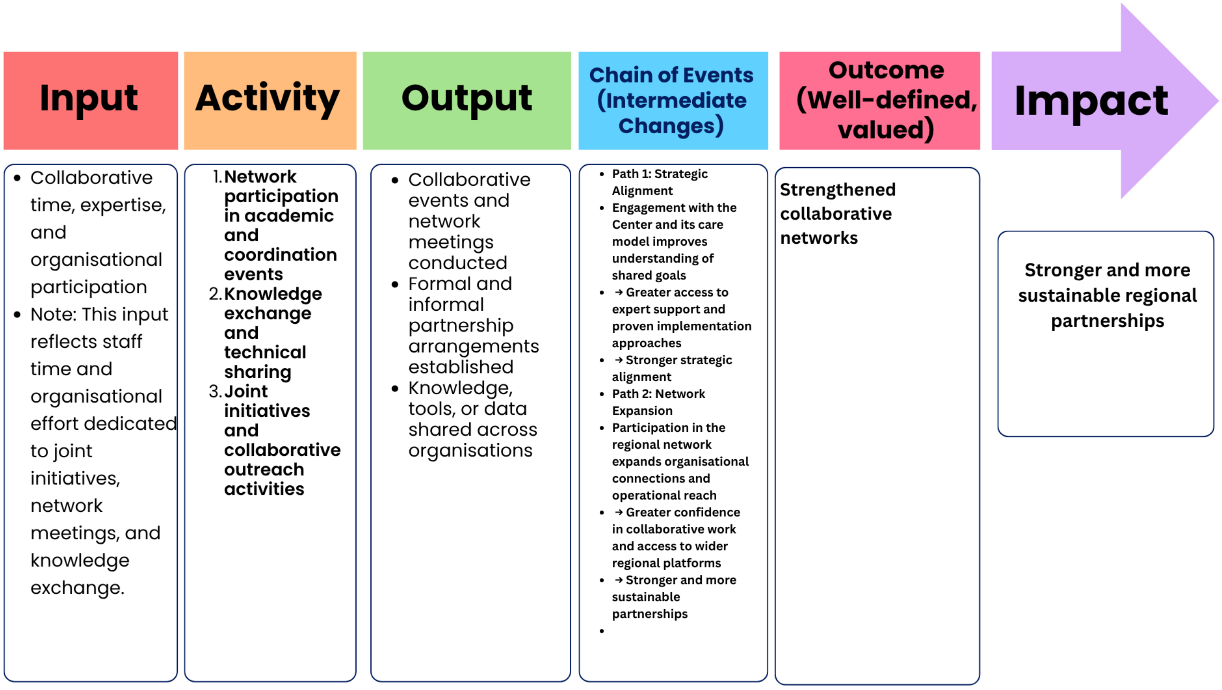
Note on Valuation: In this analysis, the outcomes identified for **Operation Smile Thailand** are treated as **strategic benefits rather than direct social outcomes for beneficiaries**. They are therefore retained for transparency in the chain of events but excluded from valuation in order to prevent double-counting of the funder's contribution and to maintain consistency with the stakeholder materiality screening process.

Stakeholder: S3.1 Operation Smile Thailand (Main Supporter)

For Operation Smile Thailand, funding, volunteer support, and strategic partnership enable treatment, outreach, and system development activities to be delivered through a capable implementing center. Verified treatment outputs, reporting, and visible implementation progress provide evidence that mission objectives are being achieved and that resources are being used effectively. At the same time, partnership with a strong center reduces management burden and increases confidence in operational efficiency and cost-effectiveness. Together, these changes generate the strategic benefit of achievement of strategic goals and enhanced donor trust. However, this benefit is retained for transparency only and is excluded from valuation in order to prevent double-counting of the funder's contribution.

Figure 12 Chain of Events for Stakeholder : S4.1 Non-profit Organizations and Other External Agencies.

Connection between participation and strengthened strategic partnerships.



Input

- Collaborative time, expertise, and organisational participation
- Note: This input reflects staff time and organisational effort dedicated to joint initiatives, network meetings, and knowledge exchange.

Activity

1. **Network participation in academic and coordination events**
2. **Knowledge exchange and technical sharing**
3. **Joint initiatives and collaborative outreach activities**

Output

- Collaborative events and network meetings conducted
- Formal and informal partnership arrangements established
- Knowledge, tools, or data shared across organisations

Chain of Events (Intermediate Changes)

- **Path 1: Strategic Alignment**
- **Engagement with the Center and its care model improves understanding of shared goals**
- **→ Greater access to expert support and proven implementation approaches**
- **→ Stronger strategic alignment**
- **Path 2: Network Expansion**
- **Participation in the regional network expands organisational connections and operational reach**
- **→ Greater confidence in collaborative work and access to wider regional platforms**
- **→ Stronger and more sustainable partnerships**
-

Outcome (Well-defined, valued)

Strengthened collaborative networks

Impact

Stronger and more sustainable regional partnerships

Stakeholder: S4.1 Non-profit Organizations and Other External Agencies

For non-profit organisations and other external agencies, collaborative time, expertise, and organisational participation are invested through network meetings, knowledge exchange, and joint initiatives with the Center. These activities provide partners with access to expert support, proven implementation approaches, and the wider regional care network. As a result, partners strengthen their strategic alignment with the project's goals and expand their operational reach and confidence in collaborative work. Together, these intermediate changes lead to the material outcome retained for valuation: strengthened collaborative networks, which in turn support stronger and more sustainable regional partnerships.

Section 2.2: Identifying Inputs and Valuing Inputs

Table 7 presents the inputs contributed or invested by each stakeholder group to enable the project to operate effectively. It includes the types of resources provided, their monetised values, and the accounting or economic valuation methods used in accordance with Social Return on Investment (SROI) principles. These input values represent the **total cumulative discounted value** of resources provided during the project implementation period (**2023–2025**) and the three years following project completion (2026-2028).

This SROI assessment identifies and values all **material inputs, both financial and non-financial, contributed by key stakeholder groups** involved in the value creation chain. By systematically mapping these resources, the analysis ensures that the total investment reflects not only direct monetary funding, but also the material time and opportunity costs of beneficiaries and other relevant stakeholders. This inclusive approach provides a transparent foundation for the SROI calculation and adheres to the principle of not over-claiming the social value generated.

Identifying inputs involves specifying all forms of resources that stakeholders dedicate to the project—whether labor, time, budget, materials, equipment, or intangible resources. In this section, inputs are classified by stakeholder role as follows:

(1) Beneficiaries

Patients' families (S1.2) contribute significant time and opportunity costs to participate in the project activities, including traveling for surgeries, attending follow-up appointments, and participating in speech training sessions. This time investment is a critical material input that enables the delivery of clinical care and the achievement of long-term outcomes.

Subdistrict Health Promoting Hospitals (SHPH) and Village Health Volunteers (VHVs) contribute time spent in monitoring and assessing patients continuously. This time investment is an essential input that enhances the completeness and quality of community-level health services.

The assessment identifies the time contributed by patients' families as a material non-financial input. To ensure a conservative valuation and avoid over-claiming, the input is estimated at 3 days per year per family. This reflects the minimum essential time required for major surgical procedures, specialized speech training sessions, and mandatory clinical follow-ups. By using a lower threshold for time investment, the analysis accounts for variations in engagement levels across the 2,643 families while still recognizing their essential contribution to the project's success.

(2) Project Implementer

The Princess Sirindhorn IT Foundation Craniofacial Center, Chiang Mai University (SCFC), serves as the main operational body. However, no additional financial input is recorded separately for the Center in the SROI calculation because the relevant operational costs are already embedded in the project funding provided by **Operation Smile Thailand**. This treatment is applied to avoid double-counting within the valuation framework.

(3) Related Agencies

Operation Smile Thailand is the **primary funder** of the project, providing financial resources for medical treatment, activity implementation, training, and medical equipment. These contributions constitute the most substantial portion of total project inputs.

Based on the identification and valuation of material inputs contributed by each stakeholder group, the total cumulative value of project resources over the 3-year period amounting to THB 22,806,475.62, consisting of:

- THB 5,632,075.74 (24.70% of total inputs) from patients' families, representing the value of time spent travelling to and attending treatment and related activities.
- THB 64,810.92 (0.28% of total inputs) from community-level health service units (SHPH/VHVs), representing the value of time contributed to follow-up.
- THB 17,109,588.96 (75.02% of total inputs) from Operation Smile Thailand, representing the project's main source of financial support.

No additional operational cost is assigned to the Princess Sirindhorn IT Foundation Craniofacial Center, Chiang Mai University (SCFC), because these expenses are already embedded in the funding provided by the main donor. This treatment is intended to avoid double-counting. Although outcomes for S1.5 SHPHs/VHVs were not taken forward for valuation due to materiality considerations, their time contribution is still recognised as a project input because it supported case follow-up and community-level continuity of care.

Table 7 Stakeholder Inputs, Input Values, and Valuation Methods

Stakeholder Group	Input / Resource	Value of Inputs / Resources	Explanation of Calculation Methods and Data Sources
S1.2 Patients' families	Time spent on travel and attending treatment/activities (surgeries, speech training, and follow-up)	5,632,075.74	Calculated based on 2,643 families spending an average of 3 days per year on travel and participation in surgeries, speech training, and follow-up activities over the 2023–2025 project cycle. The value is based on the Northern Thailand average minimum wage of 236.78 THB/day.
S1.5 Subdistrict Health Promoting Hospitals and Village Health Volunteers	Time spent on patient follow-up (every 2 months / 6 times per year)	64,810.92	Calculated using the daily minimum wage (236.78 THB/day × number of patient follow-up instances per year (6 times), multiplied by the number of personnel responsible for case monitoring.)
S2.1 Craniofacial Center, Chiang Mai University	Knowledge and labor contribution	0	Operational costs are embedded in the funding provided by Operation Smile Thailand to avoid double-counting of inputs.
S3.1 Operation Smile Thailand	Funding support for treatment, activities, and medical equipment	17,109,588.96	Calculated from the **total cumulative** financial support provided **across the full 3-year project cycle** by Operation Smile Thailand, including expenses for activities (e.g., Perfect Smile, 100 Smiles Mission), training sessions, and medical equipment used in treatment.
Total cumulative value of all material inputs (2023–2025) : THB 22,806,475.62			

Note: Input values are presented in discounted terms using the discount rate applied in this assessment.

Note on In-kind Contributions and Marginal Costs: In-kind contributions from Chiang Mai University, such as the use of clinic space, surgical rooms, existing medical equipment, and central administrative support from the Faculty of Medicine, are recognised as institutional support for the project. However, these resources are not assigned a monetary value in this assessment because they represent existing infrastructure with no additional marginal cost to the university. Their operating costs are covered by the core institutional budget and were not incurred specifically for this project phase. This conservative treatment ensures that only additional or materially relevant resources are counted, thereby avoiding double-counting of assets already covered within routine university operations or the primary funding provided by Operation Smile Thailand.

Section 3: Evidencing Outcomes and Giving Them a Value

This section focuses on verifying the outcomes that have occurred as a result of the project and assigning appropriate financial values to these outcomes. Because many social outcomes are intangible by nature, this process converts social value into economic terms so that the Social Return on Investment (SROI) ratio can be calculated in a systematic, transparent, and evidence-based manner. Both quantitative and qualitative data are used, together with credible cost references and standard valuation methods.

Section 3.1: Identifying Outcomes, Indicators, and Methods for Collecting Outcomes Data

For this project, the material stakeholder groups identified in earlier sections are taken forward into outcome evidencing and valuation. Outcomes are assessed for each included stakeholder group in accordance with the materiality screening presented in Section 1.3, and are then evidenced, valued, and adjusted using the methods described in this section. All outcomes are discounted at a rate of 3.5% and are projected to last between one and four years, depending on the nature of the impact and in accordance with the rationale provided in Table 9.

Table 8 presents the Social Return on Investment (SROI) outcome-evidencing and valuation framework for the Project, implemented by The Princess Sirindhorn IT Foundation Craniofacial Center, Chiang Mai University (SCFC). Table 8 identifies the outcomes experienced by each included stakeholder group, such as reduced developmental delays, increased confidence and social participation, reduced stress and anxiety among caregivers, saved travel time and reduced work absence, improved knowledge and practical capability among multidisciplinary teams, Increased staff satisfaction, reduced coordination time, faster patient follow-up and improved continuity of care, enhanced institutional reputation and credibility, and strengthened academic and inter-provincial service networks. Table 8 also specifies the indicator used to evidence each outcome, the financial proxy used for valuation, the data source used for verification, and the quantity logic used to scale the observed change where appropriate. These valuations are calculated using verified data sources, including stakeholder interviews, clinical records, project records, workflow evidence, ThaiCleftLink information, regional wage rates, and relevant Thai cost benchmarks.

For the **patient stakeholder group**, Table 8 should not be interpreted as assuming that all patients experience all material outcomes in the same proportion. In line with the subgroup analysis in **Section 1.2.4** and the wider beneficiary profile summarised in **Tables 4 and 4A**, earlier-stage patients are linked more strongly to **reduced developmental delays**, whereas older patients are linked more strongly to **increased confidence and social participation**. The **3–12 year** group is treated as a **transitional subgroup** in which the emphasis of outcomes may overlap. This distinction is carried forward into the quantity logic in order to avoid overstating value through uniform outcome scaling across the full patient population. This subgroup logic also has direct implications for proxy selection. The evaluation does not apply a single uniform patient proxy across all age groups, because the dominant form of value created differs materially by developmental stage. For earlier-stage patients, the primary valued change is developmental progress and reduced delay; therefore, the valuation uses a proxy aligned with avoided developmental support cost. For older patients, the dominant valued change is increased confidence and social participation; therefore, the valuation uses a proxy aligned with the cost of confidence and personal development support. The use of different proxies within the broader patient stakeholder group is therefore intentional and reflects differences in the type of outcome being valued, rather than inconsistency in the valuation approach. Aggregation is applied only where outcomes remain sufficiently comparable in definition and valuation logic.

Furthermore, to validate the level and pattern of change presented in Table 8, the assessment used a triangulation approach by cross-referencing stakeholder feedback with administrative, clinical, and system evidence wherever possible. Interviews with 13 patients/families were used primarily to identify and interpret material outcomes, while administrative, clinical, and system records were used to validate those outcomes and support cautious scaling to the wider beneficiary population. For example, the outcome of reduced developmental delays was evidenced not only through parental interviews but also through clinical developmental records maintained in the hospital database. Similarly, outcomes relating to improved coordination and follow-up efficiency were triangulated using workflow discussions, project records, and available ThaiCleftLink system information to support the plausibility of reduced retrieval, referral, and follow-up time. Where relevant, triangulation was also used to assess whether the dominant form of change differed across subgroups, particularly within the patient and family stakeholder groups. This was important because the evaluation did not assume that all stakeholders within a broad group experienced identical outcomes or identical levels of change. Instead, interview evidence, administrative records, and available workflow or system information were used together to assess both the presence of change and the pattern of change across subgroups.

3.1.1 Establishing the Baseline (Method of Measurement)

To accurately calculate the amount of change, baselines were established using a mixed-method approach tailored to each indicator type:

- **Clinical Outcomes** (e.g., developmental delays)**:** baselines were determined using **objective pre-post measurement**. The 'before' state was derived from initial medical diagnoses and developmental records in the hospital database prior to treatment.
- **Subjective Outcomes** (e.g., parental stress, patient confidence)**:** baselines were established via **retrospective recall** during in-depth interviews. Stakeholders were asked to assess their conditions prior to the project and compare them with their current status. These accounts were triangulated with social worker notes from initial visits to minimize recall bias.
- **Operational Outcomes** (e.g., Time and Cost Savings)**:** baselines represent the **counterfactual situation** (what would have happened without the project), derived from historical administrative data on standard travel frequencies and workflow durations prior to the implementation of the digital platform.

For some stakeholder groups, especially **patients** and **families**, baseline interpretation also required attention to subgroup context. For patients, the baseline was not understood only as a generic pre-project condition, but in relation to the **developmental stage** at which treatment and follow-up occurred. Earlier-stage patients were assessed primarily in relation to developmental and functional progress, while later-stage patients were assessed more strongly in relation to confidence, social participation, and psychosocial adjustment. For families, baseline burden also differed depending on whether the family received **travel/time compensation support**. These distinctions strengthen the interpretation of change and support more conservative and transparent valuation.

As part of the outcome-mapping process, the project team also assessed whether any negative or unintended outcomes arose for any stakeholder group. Stakeholder interviews, focus group discussions, and administrative reviews did not identify any material negative outcomes associated with the project. No stakeholders reported adverse effects such as increased burden, reduced access, or displacement of other services. Some minor inconveniences, such as initial adaptation to the digital system, were noted but were temporary and not material enough to include in the valuation. This conclusion is consistent with the materiality screening presented in **Section 1.3 and Table 6**, where such effects were treated as **temporary**, **minor**, or insufficiently evidenced for inclusion in the valuation. Their exclusion helps maintain a conservative approach and avoids inflating the SROI result through the inclusion of effects that were not significant enough to alter stakeholder well-being or system performance in a material way.

The structure of Table 8 consists of five core components, each interconnected to systematically analyse the social impacts generated by the project:

1) **Stakeholder Group**

   This identifies the specific subgroups of stakeholders who receive benefits or experience changes as a result of the project, such as patients, families of patients, multidisciplinary teams at Maharaj Nakorn Chiang Mai Hospital, the Faculty of Medicine at Chiang Mai University, and hospitals under the Ministry of Public Health.

2) **Outcome**

   This refers to the positive changes resulting from the project, such as reduced developmental delays, increased social confidence, reduced stress and anxiety among family members, and time savings from reduced hospital visits.

3) **Indicator**

   These are the measurable signs that demonstrate whether the outcome occurred and, where relevant, how much change occurred. Examples include the number of patients showing improved developmental progress, the number of caregivers reporting reduced stress and anxiety, the reduction in workdays lost due to hospital visits, and the reduction in coordination or follow-up time within the care system.

4) **Financial Proxy**

Financial proxies are the monetary values used to represent the worth of the measured outcome. Examples include the annual per-student development budget used as a proxy for developmental support costs, the cost of mental health treatment used as a proxy for reduced stress and anxiety, the regional minimum wage used as a proxy for time savings, and the standard public-sector training rate used as a proxy for professional capability transferred.

5) **Data Sources**

This component specifies the evidence used to validate and assign financial values to each outcome. Data sources include stakeholder interviews, operational records, and the annual reports of the Center. These sources ensure that the valuation aligns with actual experiences and verifiable project data.

The outcome indicators presented in Table 8 were measured and verified through the engagement of 40 key stakeholders (as categorized in Table 2). Data regarding the 'quantity of change' was collected using semi-structured interviews and focus groups, and subsequently triangulated with clinical records and system logs (as detailed in the Stakeholder Engagement Methodology in Appendix 1). For each material outcome, the amount of change was identified by comparing the stakeholder's baseline situation at the start of the activity with the observed position at the end of the activity. Depending on the nature of the outcome, this comparison was established using objective pre-post records, retrospective stakeholder recall, or counterfactual operational benchmarks, and was then triangulated with supporting evidence such as clinical records, ThaiCleftLink logs, appointment records, workflow evidence, and project documentation.

Overall, Table 8 provides a comprehensive and systematic mapping of how the project generates positive social, economic, and institutional impacts. These outcomes form the basis for calculating the monetised social value and the final SROI ratio of the project. At the same time, the report recognises that not all valued outcomes are evidenced with the same level of breadth or certainty across all stakeholder groups. For this reason, the later valuation steps apply **duration assumptions**, **impact adjustments**, and **sensitivity testing** to ensure that monetised values remain proportionate to the underlying evidence base. This is especially important where outcomes are derived from a small qualitative sample and then cautiously interpreted in relation to the wider beneficiary population.

Table 8 Social Return on Investment (SROI) Analysis of Stakeholder Groups

Stakeholder Group	Outcome (Change)	Indicator (Measurable Change)	Financial Proxy (Valuation Basis)	Data Source	Quantity Logic
S1.1a Patients aged 0–3 years	**Reduced developmental delays**	Number and proportion of patients demonstrating improvement in age-appropriate developmental milestones (speech, feeding, motor skills) following treatment	Avoided cost of development activities: **THB 780.75 per person/year**, based on the annual per-student budget allocated by **OBEC (2024)**	**Qualitative**: 100% responded Caregiver interviews (n=13) to identify and validate change **Administrative/Clinical:** Hospital developmental records to verify improvement **Population data:** Programme database (n=2,643) used for scaling with conservative assumptions	Quantity of change is applied to the **0–3 year patient subgroup (435 patients; 16.46%)** as the developmentally relevant beneficiary group. The quantity reflects the number of patients evidencing improved developmental progress following treatment and continuity of care, triangulated from interviews and clinical records and then applied conservatively to the wider subgroup. The amount of change reflects the difference between the patient's developmental status at the start of treatment, as recorded in the initial clinical and developmental assessment, and the observed developmental progress after treatment and continuity of follow-up care.

Stakeholder Group	Outcome (Change)	Indicator (Measurable Change)	Financial Proxy (Valuation Basis)	Data Source	Quantity Logic
S1.1b Patients aged 3–12 years	**Mixed (development + confidence)**	Number and proportion of patients (aged 3–12) demonstrating developmental progress and/or improved participation in school/social settings (based on dominant outcome)	Applied using the relevant proxy in the valuation model depending on the dominant form of change evidenced: **THB 780.75 per person/year** for developmental progress and **THB 4,200 per course** for confidence/social participation	**Qualitative:** 100% responded - Caregiver interviews (n=13) **Administrative**: Clinical and follow-up records **Supporting:** School/activity participation evidence (where available) **Population data:** Programme database (n=2,643) was used for cautious subgroup scaling to the wider beneficiary population.	Quantity of change is applied to the 3**–12 year patient subgroup (824 patients; 31.18%)** as a **transitional subgroup** in which the emphasis of outcomes may overlap. This subgroup is not assumed to experience both outcomes equally in all cases. Instead, the quantity is allocated conservatively in the valuation model according to the dominant form of change evidenced through interviews, records, and follow-up information. The amount of change reflects the difference between the patient's baseline developmental and social-functioning position prior to treatment and the observed position after treatment, follow-up, and support activities.

Stakeholder Group	Outcome (Change)	Indicator (Measurable Change)	Financial Proxy (Valuation Basis)	Data Source	Quantity Logic
S1.1c Patients aged 12 years and above	**Increased confidence and social participation**	Number and proportion of patients demonstrating increased confidence in social interaction and participation	Cost of self-confidence / personality development training: **THB 4,200 per course**, based on the **CMU Lifelong Learning Institute (2024)**	**Qualitative**: 100% responded in Patient interviews (n=13) **Administrative/Programme records:** Treatment records, relevant follow-up records, Speech Camp participation records, and related activity records were used to verify the reported change. **Population data:** Programme database (n=2,643) was used for cautious subgroup scaling to the wider beneficiary population.	Quantity of change is applied to the **12 years and above patient subgroup (1,384 patients; 52.33%)** as the social-participation-relevant beneficiary group. The quantity reflects the number of patients evidencing improved confidence and participation after treatment and support activities, triangulated from interviews and activity records and then applied conservatively to the wider subgroup. The amount of change reflects the difference between the patient's baseline level of confidence and social participation prior to treatment and support activities and the observed level of confidence and participation after treatment, follow-up, and supportive activities.

Stakeholder Group	Outcome (Change)	Indicator (Measurable Change)	Financial Proxy (Valuation Basis)	Data Source	Quantity Logic
S1.2 Patient Families	**Reduced stress and anxiety**	Number and proportion of caregivers reporting reduced stress and anxiety	Cost of depression / mental health treatment: **THB 1,775 per 16-week cycle**, derived from the TDRI SROI assessment on health promotion (2012)	**Qualitative**: Caregiver interviews within the overall interview set (n=13) were used to identify and interpret the reported change. **Administrative/Clinical:** Home-visit logs and treatment records were used to corroborate the reported change. **Population data**: The eligible family population recorded in the programme database was used for cautious scaling to the wider beneficiary population.	Quantity of change is based on the number of family caregivers reporting reduced stress and anxiety after improved treatment coordination and reassurance. Applied conservatively to the eligible family group. The amount of change reflects the difference between the caregiver's baseline level of stress, anxiety, and uncertainty at the start of the care process and the observed position after improved treatment coordination, continuity of care, and reassurance regarding the child's future .

Stakeholder Group	Outcome (Change)	Indicator (Measurable Change)	Financial Proxy (Valuation Basis)	Data Source	Quantity Logic
S1.2.1 Patient families without travel/compensation support	**Time saved (visits & work absence)**	Number and proportion of caregivers reporting reduction in number of hospital visits and caregiver workdays lost per year	Opportunity cost of time: **THB 236.78 per day**, based on the average minimum wage in Northern Thailand (Ministry of Labour, 2022)	**Qualitative**: Caregiver interviews within the overall interview set (n=13) were used to identify and interpret the reported reduction in burden. **Administrative/System records:** Hospital scheduling records, appointment records, and ThaiCleftLink logs were used where available to verify reduced visit frequency and follow-up burden. **Population data:** Project records and subgroup totals were used for cautious scaling to the wider beneficiary population.	Quantity of change is applied separately to **2,188 families without travel/time compensation support**. Based on interview and appointment-log evidence, each eligible family is estimated to save **6 workdays per year** from fewer hospital visits and reduced work absence. Improved coordination and monitoring are also estimated to reduce the follow-up burden and support continuity of treatment over an average period of **1.5 months**. The amount of change reflects the difference between the pre-project pattern of more frequent hospital visits and greater workdays lost, and the observed position after coordinated appointments reduced the number and burden of hospital visits.

Stakeholder Group	Outcome (Change)	Indicator (Measurable Change)	Financial Proxy (Valuation Basis)	Data Source	Quantity Logic
S1.2.2 Patient families receiving travel/compensation support	**Time saved (visits & work absence)**	Number and proportion of caregivers reporting reduction in number of hospital visits and caregiver workdays lost per year	Opportunity cost of time: **THB 236.78 per day**, based on the average minimum wage in Northern Thailand (Ministry of Labour, 2022)	**Qualitative:** Caregiver interviews within the overall interview set (n=13) were used to identify and interpret the reported reduction in burden. **Administrative/System records:** Hospital scheduling records, appointment records, and ThaiCleftLink logs were used where available to verify reduced visit frequency and follow-up burden. **Population data:** Project records and subgroup totals were used for cautious scaling to the wider beneficiary population.	Quantity of change is applied separately to **495 families receiving travel/time compensation support**. Based on interview and appointment-log evidence, each eligible family is estimated to save **6 workdays per year** from fewer hospital visits and reduced work absence. Improved coordination and monitoring are also estimated to reduce the follow-up burden and support continuity of treatment over an average period of **1.5 months**, although the economic burden differs from that of uncompensated families. The amount of change reflects the difference between the baseline frequency and burden of hospital visits before coordinated scheduling and the observed position after visit frequency and work absence were reduced, while recognising that the economic context differs from that of families without compensation support.

Stakeholder Group	Outcome (Change)	Indicator (Measurable Change)	Financial Proxy (Valuation Basis)	Data Source	Quantity Logic
S1.3 Maharaj Nakorn Chiang Mai Hospital, Faculty of Medicine, CMU	**Increased staff satisfaction**	Number and proportion of staff reporting increased job satisfaction and fulfilment	Shadow price of life satisfaction / wellbeing from helping others: **THB 4,637 per month**, based on Chandduaywit (2014)	**Qualitative**: Interviews with multidisciplinary staff were used to identify and interpret the reported change. **Administrative**: Internal satisfaction reports	Quantity of change is based on the number of directly involved staff evidencing increased pride and job satisfaction from participating in the coordinated care model. Applied conservatively to the relevant hospital team. The amount of change reflects the difference between the baseline level of professional fulfilment associated with routine service roles and the observed increase in pride and job satisfaction after participation in the coordinated care model and multidisciplinary network.
S1.4 Ministry of Public Health Hospital	**Knowledge gains among Ministry of Public Health hospital staff**	Number and proportion of staff demonstrating increased competency post-training	Standard speaker/trainer rate of THB 600 per hour, in accordance with the Ministry of Finance Regulation on Expenses for Training (No. 3) B.E. 2555 (Comptroller General's Department, 2012). This value is used as a proxy for the economic value of professional capability transferred.	**Qualitative**: Interviews (n=2) **Administrative**: Training attendance and evaluation records	Quantity of change is based on the number of staff trained and applying relevant knowledge in practice, using attendance records and interview evidence. Applied conservatively to the relevant group of hospital staff. The amount of change reflects the difference between staff capability before project-related training and technical support, and the observed level of knowledge and practical confidence after participation in workshops, case-based learning, and network support activities.

Stakeholder Group	Outcome (Change)	Indicator (Measurable Change)	Financial Proxy (Valuation Basis)	Data Source	Quantity Logic
S1.4 Ministry of Public Health Hospitals	**Reduced coordination time**	Average reduction in hours spent on inter-agency coordination per month	Value of staff time saved, using the relevant public-sector staff time rate or standard professional rate adopted in the report	**Administrative**: System logs, workflow data **Qualitative**: Staff interviews (n=2)	Quantity of change is based on estimated coordination time saved per case or per staff member after use of the digital referral and follow-up system, then applied conservatively to the relevant number of staff or cases. The amount of change reflects the difference between coordination time under the prior workflow before the digital referral and follow-up system was introduced, and the observed time required after adoption of ThaiCleftLink and improved coordination processes.
S1.4 Ministry of Public Health Hospitals	**Reduced follow-up time**	Reduction in administrative hours required for patient tracking and follow-up	Value of staff time saved, using the relevant public-sector staff time rate or standard professional rate adopted in the report	**Administrative**: Thai CleftLink logs and workflow data **Qualitative**: Staff interviews (n=2)	Quantity of change is based on reduced time required to monitor and follow up patients through the system, with continuity of patient follow-up improved over an average period of **1.5 months** compared with the prior fragmented process. The amount of change reflects the difference between the fragmented follow-up process before implementation of the integrated system and the observed position after follow-up information became more accessible and continuity of care improved.

Stakeholder Group	Outcome (Change)	Indicator (Measurable Change)	Financial Proxy (Valuation Basis)	Data Source	Quantity Logic
S1.6 Provincial Public Health Offices (PHOs)	**Strengthened collaboration**	Number of joint initiatives, protocols, and collaborations implemented	Proxy value of network-strengthening / collaboration benefit, as used in the current valuation model	**Qualitative:** Interviews with Provincial Public Health Office representatives were used to identify and interpret the reported collaborative change.(n=2) **Administrative**: Meeting minutes, collaboration records	Quantity of change is based on **8 PHO units and 30 persons** involved in the strengthened collaboration network. The amount of change reflects the difference between the baseline level of inter-agency coordination prior to the project and the observed level of academic, technical, and inter-provincial collaboration after the introduction of shared protocols, network governance, and the ThaiCleftLink system.
S2.1 Craniofacial Center, Chiang Mai University (SCFC)	**Institutional reputation**	Percentage increase in funding or budget attributable to project	Increased budget allocation / funding gained in the following year, as used in the current valuation model	**Qualitative**: Management interviews were used to identify and interpret the reported change in institutional reputation and credibility. **Administrative**: Financial reports and budget records	Quantity of change is based on the institutional-level change evidenced through increased budget allocation and stakeholder recognition attributable to the project. The amount of change reflects the difference between the Center's baseline institutional position before implementation of the project network and the observed increase in recognition, trust, and budget-related support following successful project delivery and network stewardship.

Stakeholder Group	Outcome (Change)	Indicator (Measurable Change)	Financial Proxy (Valuation Basis)	Data Source	Quantity Logic
S4 External Partners (NGOs, foundations, and health partners)	**Strengthened collaborative networks**	Number of partnerships, joint missions, and MOUs established	Proxy value of strengthened partnership / collaboration benefit, as used in the current valuation model	**Qualitative**: Partner interviews were used to identify and interpret the reported collaborative change. (n=3) **Administrative**: Partnership agreements, activity records, and related collaboration documents were used to verify the reported change.	Quantity of change is based on **3 partner organisations (3 units)** evidencing stronger long-term collaboration with the Center. The amount of change reflects the difference between the baseline level of collaboration prior to project-linked engagement and the observed position after joint activities, coordination meetings, and sustained participation in the regional care network.

Note: All indicators were validated by stakeholders during verification interviews following the outcome assessment. For some outcomes—especially those derived from a small qualitative sample—the quantity of change has been estimated using triangulation between stakeholder interviews, project records, and digital system logs. These estimates are applied conservatively and, where relevant, separately by subgroup to improve transparency and avoid over-claiming. Where appropriate, the amount of change was interpreted as the difference between the stakeholder's baseline situation at the start of the activity and the observed position at the end of the activity. The valuation model does not assume that every member of a stakeholder group experienced the identified outcome to the same degree. Where full population-level verification was not available, outcome scaling was applied conservatively and tested through sensitivity analysis.

Section 3.2: Determining the Duration of Outcomes (Establishing how long outcomes last)

Table 9 Duration of Outcomes and Rationale

Outcome for Beneficiaries	Duration	Rationale for Temporal Boundaries (2023–2028)	Data Sources
S1.1 Patients: Reduced developmental delays	4 Years	Clinical gains during 2023–2025 are sustained for three additional years (through 2028) as children continue to meet milestones without regression.	Clinical follow-up records, Annual Reports, and Clinician interviews.
S1.1 Patients: Increased confidence and social participation	4 Years	Behavioral skills built during the 3-year project provide a foundation that caregivers verify lasts for three additional years post-program.	Stakeholder interviews, CMU activity records, and Annual Reports.
S1.2 Families: Reduced stress, anxiety, and concerns about the child's future	2 Years	Emotional relief is highest during active support (2023–2025) and is projected to last for one additional year as treatment cycles stabilize.	Parent interviews, Treatment cycle records, and Home-visit logs.
S1.2.1 Families without travel/compensation support: Time saved (visits & work absence)	2 Years	Efficiency gains are tied to active appointment cycles (2023–2025) and persist for one additional year before routines stabilize.	Hospital appointment logs, System usage data, and Stakeholder interviews.
S1.2.2 Families receiving travel/compensation support: Time saved (visits & work absence)	2 Years	Economic benefits are tied to reduced visit frequency during the project and remain for one additional year post-completion.	Hospital information system (HIS) and Family interviews.
S1.3 Maharaj Nakorn Chiang Mai Hospital: Increased staff satisfaction	4 Years	Professional satisfaction from building the 8-province network during 2023–2025 persists for three additional years of continued practice.	Staff interviews, Shadow price studies, and Annual Reports.

Outcome for Beneficiaries	Duration	Rationale for Temporal Boundaries (2023–2028)	Data Sources
S1.4 Ministry of Public Health Hospitals : Knowledge gains among Ministry of Public Health hospital staff	4 Years	Knowledge acquired during 2023–2025 workshops remains relevant and applied in clinical practice for three additional years.	Training attendance logs, Staff interviews, and Annual Reports.
S1.4 Ministry of Public Health Hospitals: Reduced coordination time	4 Years	Workflow efficiencies established during 2023–2025 are embedded in the system and persist for three additional years through 2028.	Workflow records, Provincial coordination logs, and Annual Reports.
S1.4 Ministry of Public Health Hospitals: Reduced follow-up time	4 Years	The integrated database used during the 3-year project remains the primary follow-up tool for three additional years.	Database usage logs, HIS records, and Staff interviews.
S1.6 Provincial Public Health Offices (PHOs): Strengthened collaboration	4 Years	Partnerships formalized during 2023–2025 are expected to remain active and provide value for three additional years.	Meeting minutes, Collaboration records, and Annual Reports.
S2.1 Craniofacial Center, Chiang Mai University (SCFC): Institutional reputation	1 Year	Budgetary gains are verified for the immediate subsequent fiscal year and are conservatively limited to one year.	Center's financial reports and Senior management interviews.
S4 External Partners (NGOs, foundations, and health partners): Strengthened collaborative networks	4 Years	Collaborative structures with organizations like Operation Smile are maintained and generate benefits for three additional years.	Partnership agreements, Activity records, and Annual Reports.

Determining the Duration of Outcomes is a crucial step in the SROI analysis, as it assesses how long the outcomes continue to affect beneficiaries and the service system beyond the immediate effects of project activities. This assessment draws on empirical evidence from project data, annual performance reports, and stakeholder interviews. For clarity, the report distinguishes between the duration assigned to a specific outcome and the overall value-creation horizon used in the model. The duration shown in Table 9 refers to the expected persistence of each individual outcome once it has occurred, expressed as a conservative estimate of how long that outcome continues to generate value. Separately, the overall model captures value across the full project implementation period (2023–2025) and allows for post-project persistence through 2028 where outcome duration justifies this. This means that the report does not assume that every outcome lasts for the full six-year horizon; rather, each outcome is valued according to its own duration assumption within the broader temporal boundary of the analysis.

Based on Table 9, the duration of outcomes is determined by three key factors:

1. **Continuity of service systems and patient follow-up**, which are implemented regularly across the 8-province network for the full 3-year project period (2023–2025).
2. **The nature of the outcomes**, whether they relate to developmental progress, confidence, family burden, professional capability, or system improvements —each of which tends to persist according to the natural processes of child development and professional capacity-building.
3. **Empirical evidence** from parents, patients, and healthcare personnel indicating observable changes occurring 1–3 years after participation in project activities.

Furthermore, the project applied triangulation to validate these duration estimates. The expected persistence of outcomes reported by families (e.g., long-term confidence) was cross-referenced with the clinical prognosis provided by medical specialists. Experts confirmed that corrective surgeries performed at specific developmental stages typically yield permanent physical improvements, thereby medically substantiating the long-term duration applied in the model. This alignment between beneficiary expectations and clinical evidence ensures that the duration assumptions are robust.

Outcomes related to child development, increased confidence among children, enhanced competencies of healthcare personnel, and the use of the integrated patient information system across hospital networks are long-lasting outcomes aligned with developmental cycles and service-system improvements. These outcomes are assigned a **duration of 4 years** in the SROI model. This duration encompasses the **3-year active implementation cycle (2023–2025)**—treated as the base period of change—followed by **three subsequent years (2026–2028)** of sustained impact. This approach ensures that the total social value of **THB 93,379,924.91** accounts for the full benefit window through **2028**.

In contrast, outcomes such as reduced time burden, decreased travel, and lower parental stress are short-term and tied closely to appointment cycles and treatment schedules. These outcomes typically persist for **two years** (comprising the initial year of change and one subsequent year), based on actual changes observed and evidence gathered from interviews with families.

Section 3.3: Valuation and Establishing Impact

This section presents the valuation of outcomes and the application of impact adjustment factors. Table 13 presents the estimated impact values using the selected financial proxies, with details summarised as follows.

- **Reduced developmental delays in patients:** Valued at **THB 780.75 per child per year**, based on the annual per-student development budget allocated by the Office of the Basic Education Commission (OBEC, 2024). This represents the avoided cost of supplemental developmental interventions.
- **Increased confidence and social participation among patients**: Valued at **THB 4,200 per person**, referencing the market cost of a certified self-confidence training course offered by the Chiang Mai University Lifelong Learning Institute (2024).
- **Reduced stress, anxiety, and concerns about the child's future among caregivers**: Valued using the cost of outpatient treatment for stress/depression—**THB 1,775 per 16-week cycle**— derived from the reference study *Social Return on Investment (SROI) Assessment of Health Promotion and Disease Prevention Projects for Children and Youth* (TDRI, 2012).
- **Saved travel time and reduced work absence for families**: Families reduced annual hospital visits from 12 full-day visits to 12 half-day visits, saving **6 days per year**. The proxy applies the average minimum wage in Northern Thailand (THB 236.78 per day), **derived from the rates in** Chiang Mai, Lamphun, Chiang

Rai, Nan, Phayao, Phrae, Lampang, and Mae Hong Son as announced in the *Royal Gazette* (Ministry of Labour, 2022, Vol. 139, Special Section 234 D).

- **Increased staff satisfaction at Maharaj Nakorn Chiang Mai Hospital**: Valued using wellbeing valuation reflecting the shadow price of increased life satisfaction from helping others, **THB 4,637 per month**, based on national research by Chandduaywit (2014).
- **Knowledge gains among Ministry of Public Health hospital staff:** Valued using the standard speaker rate of THB 600 per hour, in accordance with the *Ministry of Finance Regulation on Expenses for Training (No. 3) B.E. 2555 (Comptroller General's Department, 2012)*. This value represents the economic value of professional capability transferred.
- **Reduced coordination time in Ministry of Public Health hospitals**: Coordination time decreased from approximately two weeks to three days. The value of **7 days saved** per professional was calculated using the average minimum wage in Northern Thailand (THB 236.78/day), derived from the official rates of the eight northern provinces (Ministry of Labour, 2022).
- **Reduced follow-up time**: Patient information search time was reduced from **1–2 months to approximately 1 minute**. The avoided cost equates to the value of **1.5 months of administrative time**, valued using the Northern Thailand minimum wage benchmark (**THB 236.78 per day**)[1].
- **Community-level follow-up by SHPHs/VHVs** was identified as a positive contextual effect but was not monetised in the final valuation, in order to maintain a conservative approach.
- **Strengthened collaboration** (PHOs): Valued using the cost of organising academic meetings and coordination activities delivered by the Craniofacial Center.

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[1] **Data Source:** Time reduction statistics derived from interviews with MoPH hospital staff (n=2). Valuation: Calculated using the average minimum wage in Northern Thailand (THB 236.78/day) based on the Ministry of Labour Notification (2022).

- **Institutional reputation of the Craniofacial Center:** Valued using the increase in operational budget allocated to the Center in the subsequent fiscal year. This outcome is counted for only one year to adhere to conservative valuation principles and avoid overclaiming.
- Operation Smile Thailand was treated strictly as a funder. While strategic organisational benefits were acknowledged in the chain of events, they were excluded from valuation to prevent double-counting of inputs.
- Strengthened collaborative networks: Strengthened long-term collaboration with NGOs, foundations, and health partners was valued using the cost of academic meeting organisation as a proxy for the economic value of expanded collaboration.

These proxies were selected for their relevance, defensibility, and conservative nature. Where multiple proxy options existed, the valuation adopted the lowest reasonable estimate to avoid overclaiming. Limitations—such as cultural variation in wellbeing valuation and incomplete market equivalents for emotional outcomes—were acknowledged and addressed through cautious assumptions.

Tables 10–12 present the application of the four standard SROI adjustment factors—deadweight, displacement, attribution, and drop-off—to each material outcome generated by the project. These adjustments ensure that the analysis reflects only the proportion of change genuinely attributable to the project, rather than the total observed change. By applying these factors consistently across outcomes, the assessment maintains methodological rigour, avoids overclaiming, and adheres to Social Value International (SVI)'s assurance standards.

The first adjustment, **deadweight**, measures how much of the observed change might have happened without the project. Deadweight was set at 0% for all outcomes. This determination is supported by a triangulation of stakeholder interviews and **an assessment of the counterfactual 'standard of care.'**

Although Thailand provides Universal Health Coverage (UHC), the author's judgement—referenced against healthcare access benchmarks—indicates that structural barriers (such as travel costs and wait times) often prevent remote populations from accessing these entitlements. Without the project's proactive network and mobile coordination, the likely counterfactual for this specific demographic is 'treatment abandonment' rather than 'treatment via standard channels.'

Furthermore, clinical benchmarks confirm that craniofacial anomalies do not resolve spontaneously; without the specific surgical and therapeutic interventions facilitated by this project, developmental delays would persist. Consequently, stakeholders—including patients, caregivers, and medical staff—consistently affirmed that improvements in child development, reductions in family stress, enhanced clinical pathways, and more efficient coordination **would not have occurred** without the project's specialised follow-up system, integrated data platform, and multi-hospital network. These components did not exist prior to the project and are not replicated by other services; therefore, the outcomes can reasonably be attributed to the project's intervention.

Specifically for outcomes regarding developmental delays (S1.1), the assignment of 0% deadweight is strongly supported by recent evidence from the Northern Thailand Cleft Lip and Cleft Palate Healthcare Network itself (Sirikul et. al, 2025[2]). This retrospective study reveals that prior to the network's establishment, the median time to first patient evaluation was as high as 107 months (approximately 9 years), compared to just 4 months in the recent cohort.

This empirical data serves as a definitive counterfactual: without the project's proactive intervention, the 'standard' outcome for patients in this region is a delay of nearly a decade, which clinically guarantees persistent speech and developmental deficits. Thus, attributing the full change to the project (0% deadweight) is factually justified.

The second adjustment, **displacement**, evaluates whether the project's benefits reduce or replace other positive outcomes elsewhere. For nearly all outcomes, displacement was negligible, reflecting that the project's contributions did not adversely affect other programmes, community services, or institutional activities. In this evaluation, displacement was assessed separately for each outcome category and was found to be negligible for almost all valued outcomes because the project added capacity rather than diverting value elsewhere. The only exception was in saved travel time and reduced work absence for families. While reduced travel and fewer hospital visits

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[2] Sirikul W, Buawangpong N, Isaradech N, Sirimaharaj W, Charoenvicha C, Gomez LH, Yao C, Torres N, Khwanngern K. Treatment Outcomes of Cleft Lip and Cleft Palate Healthcare Network in Northern Thailand. Plast Reconstr Surg Glob Open. 2025 Jul 18;13(7):e6966. doi: 10.1097/GOX.0000000000006966. PMID: 40686756; PMCID: PMC12273646.

provided clear efficiency gains, these benefits could temporarily shift household routines or reduce engagement in other minor activities. To reflect this possibility, a 10% displacement factor was applied to these specific outcomes. By contrast, benefits such as improved child development, strengthened hospital systems, and increased staff pride did not diminish any external value and therefore retained a displacement rate of 0%. Accordingly, displacement was set at 0% where no credible evidence suggested that value was being reduced elsewhere, and a non-zero rate was used only where a plausible offsetting effect could reasonably occur. This approach was adopted as a risk-mitigation measure to reduce the possibility of over-claiming, particularly where family time savings might not translate fully into wholly net new value. It also reflects a conservative treatment of uncertainty, in which displacement was only applied where there was a credible basis for assuming that some value may have been offset elsewhere.

Table 10 provides a detailed breakdown of the justification and evidence for the displacement rates applied to each outcome category.

Table 10 Displacement Justification and Evidence

Outcome	Displacement (%)	Justification & Evidence
Clinical and service outcomes (reduced developmental delays; increased confidence and social participation; increased staff satisfaction; knowledge gains; reduced coordination time; faster follow-up and improved care continuity; strengthened academic and inter-provincial health networks; enhanced institutional reputation; strengthened long-term collaboration)	0%	Justification: The project is funded by external grants (Operation Smile) and uses digital tools to add capacity. It does not divert budget or personnel from other hospital departments. Evidence: Hospital administrators confirmed that no other patient waitlists increased and no resources were removed from other wards to support this project.
Family stress-related outcomes (reduced stress, anxiety, and concerns about the child's future)	0%	Justification: The reduction in stress does not cause stress elsewhere. It is a net gain in family well-being.
Family stress-related outcomes (reduced stress and anxiety)	10%	Justification: A conservative 10% is applied to account for the possibility that while travel time is saved, the new requirement to perform home-care or use the digital application might displace a small amount of other leisure or household time.

Consequently, the project is determined to generate almost entirely net new social value without displacing existing services.

The third adjustment, attribution, recognises that multiple actors contributed to the observed outcomes. Because the project operates through partnerships with hospitals, community health workers, and family caregivers, it is essential to account for these shared contributions. Attribution percentages were validated through stakeholder interviews. Across respondents, 68–82% of families reported that improvements in developmental progress and stress reduction were jointly influenced by hospital support, family care, and follow-up services, supporting a higher attribution adjustment for these outcomes. Medical staff reported that approximately part of the workflow improvements depended on existing institutional roles, infrastructure, and staff practice, although some project-specific workflow outcomes were treated as fully attributable to the project. Attribution rates ranging from 0% to 60% were assigned depending on the nature of each outcome. For example, improvements in clinical coordination and data management were largely driven by the project and thus have lower attribution rates. In contrast, outcomes such as reduced stress, anxiety, and concerns about the child's future, or increased confidence and social participation, involve multiple supporting actors—families, local hospitals, and community networks—and therefore require higher attribution adjustments. These estimates were validated through interviews, workshops, and stakeholder feedback to ensure an accurate representation of real-world conditions.

To ensure the attribution rates reflect reality, specific assumptions were developed for each outcome based on stakeholder feedback. Table 11 shows the evidence and rationale used to determine the level of attribution to external factors:

Table 11 Attribution Assumptions and Evidence

Outcome	Attribution to Others (%)	Rationale / Assumption	Evidence Source
Reduced developmental delays (Patients)	25%	Assumption: Clinical surgery is the primary driver (75%), but natural growth, school environment, and family nutrition also contribute to development (25%).	Medical Staff Interviews: Confirmed that surgery allows speech, but practice at home/school is required for full mastery.
Increased confidence and social participation (Patients)	50%	Assumption: Although the project's treatment, follow-up care, and support activities were important drivers of improved confidence and social participation, this outcome was also influenced by other external factors, including family encouragement, school environment, peer acceptance, and the child's ongoing psychosocial development. A 50% attribution to others was therefore applied to reflect the shared contribution of these non-project factors.	Patient/family interviews (n=13); staff interviews; and outcome materiality review showing that physical improvement was treated as an intermediate driver of social confidence rather than a separately valued outcome.
Reduced stress and anxiety (Families / caregivers)	50%	Assumption: Stress is multi-factorial. While the project reduces medical anxiety, other factors like debts, general family support, and economic conditions (external) play a major role (50%).	Family Interviews (n=13): 82% of families cited "support from relatives" and "informal loans" as other key stress relievers.
Time saved (visits & work absence) (Families / caregivers)	0% - 50%	Assumption: The reduction in visits is entirely driven by the project's specific digital appointment system. No other external agency provides this remote queue management.	Comparison Data: Review of standard hospital procedures confirms no alternative online booking system exists for these clinics.

Outcome	Attribution to Others (%)	Rationale / Assumption	Evidence Source
Increased staff satisfaction (Maharaj Nakorn Chiang Mai Hospital)	25%	Assumption: Although the project's coordinated care model, digital system, and multidisciplinary network were the main drivers of increased staff satisfaction, part of this outcome was also influenced by existing professional identity, prior institutional culture, and routine hospital service roles. A 25% attribution to others was therefore applied to reflect these background influences, while recognising that the majority of the observed change was generated by the project.	Interviews with multidisciplinary staff at Maharaj Nakorn Chiang Mai Hospital; internal service records; and project documentation on coordinated care and network implementation.
Knowledge gains among Ministry of Public Health hospital staff	60%	Assumption: High attribution to others because professional skills are also built through daily routine practice, medical school foundations, and other unrelated CME training.	Staff Interviews: Staff indicated that while project workshops were triggers, on-the-job experience accounts for the majority of their skill growth.
Reduced coordination time in Ministry of Public Health hospitals	30%	Assumption: The project provided the tool (Database), but the effort to coordinate also depends on existing hospital internet infrastructure and staff diligence.	Workflow Analysis: Observations showed that internet speed and internal hospital policies (external factors) also impact coordination speed.
Reduced follow-up time	0%	ssumption: This outcome was treated as fully attributable to the project because the reduction in follow-up time and the improvement in continuity of care were generated directly by the project's integrated referral and patient information system, coordinated appointment processes, and multi-hospital follow-up mechanism. No equivalent external system or parallel intervention was identified that could reasonably explain this specific improvement. Therefore, the observed change was treated as arising from the project rather than from other actors.	Interviews with Ministry of Public Health hospital staff; ThaiCleftLink records; follow-up workflow discussions; and project documentation showing the use of the integrated multi-hospital data system.

Outcome	Attribution to Others (%)	Rationale / Assumption	Evidence Source
Strengthened collaboration (PHO)	40%	**Assumption:** The project substantially strengthened academic and inter-provincial collaboration, but part of the outcome also depended on existing provincial health structures, routine coordination mechanisms, and prior institutional relationships. Therefore, 40% attribution to others was applied.	PHO interviews, network meeting records, and project coordination documents.
Institutional reputation	0%	**Assumption:** The increase in institutional reputation and credibility was driven directly by the Center's successful project implementation and resulting budget recognition. No separate external programme was identified as the primary cause.	Internal budget records, project documentation, and stakeholder interviews.
Strengthened collaborative networks	0%	**Assumption:** The strengthened collaboration was generated directly through project-led joint activities, coordination, and network engagement. No separate external initiative was identified as the main cause of this change.	Partner interviews, records of joint activities, and project coordination documents.

The fourth adjustment, drop-off, accounts for the decline in the value of an outcome over time once the project's active support ends. Outcomes were assigned drop-off rates based on their expected duration, ensuring that no value is claimed beyond the verified period of 2023–2028. Long-lasting system-level changes—such as improved coordination mechanisms, professional knowledge transfer, and strengthened partnerships—were assigned gradual drop-off rates (typically 33%) across a four-year horizon. Shorter-term outcomes, such as reduced parental stress and time savings, were assigned higher annual drop-off rates (up to 50%) to reflect that their value decreases once treatment cycles stabilise or after initial behaviour changes dissipate. Some outcomes, such as institutional reputation, were tied to yearly budget cycles and therefore applied with 0% drop-off because they are relevant for only one financial year.

Table 12 explicitly details the assumptions made for each outcome category and the specific evidence used to justify these rates:

Table 12 Drop-off Assumptions and Evidence

Outcome Type	Duration / Drop-off Rate	Assumption & Rationale (Why this rate?)	Evidence Source (Proof)
Systemic & Skills Outcomes (e.g., staff satisfaction , knowledge gains among hospital staff, coordination time, time required for patient follow-up and strengthened networks)	3 Years (33% Drop-off)	Assumption: Professional skills and system efficiencies degrade linearly over a 3-year cycle if not reinforced. (Alignment: Value diminishes annually but remains material until 2028).	Stakeholder Interviews: Medical staff indicated that without refresher workshops every 2-3 years, their confidence in handling complex/rare cases begins to decline.
Personal Wellbeing Outcomes (e.g., reduced stress and anxiety, saved travel time and reduced work absence)	2 Years (50% Drop-off)	Assumption: High drop-off reflects 'hedonic adaptation.' Families experience intense relief initially, but adapt to the 'new normal' quickly. (Alignment: Value ceases shortly after the active phase).	Longitudinal Feedback: Interviews with families treated 2+ years ago revealed that while they remain grateful, their acute stress levels regarding the condition have normalized.
Clinical Outcomes (e.g., Reduced Developmental Delays and increased confidence and social participation)	4 Years (33% Drop-off)	Assumption: Surgery is permanent, but developmental milestones require ongoing practice. The impact of the initial intervention dilutes as the child faces new growth challenges.	Clinical Standards: Medical consensus suggests that surgical success provides a strong foundation, but its isolated impact diminishes as the child grows and requires new forms of support (e.g., orthodontics).

Outcome Type	Duration / Drop-off Rate	Assumption & Rationale (Why this rate?)	Evidence Source (Proof)
Institutional Outcomes (e.g., enhanced institutional reputation and credibility)	1 Year (0% Drop-off)	Assumption: This outcome is tied to a specific fiscal year budget allocation. It is a one-off realization with no future tail.	Financial Records: The budget allocation is recorded as a single-year event in the Center's accounting system.
Strategic benefits for funders (not monetised)	Excluded from valuation	Assumption: Strategic benefits for Operation Smile Thailand are acknowledged in the chain of events but excluded from the SROI valuation to avoid double-counting of inputs.	Project design, funding records, and valuation boundary decisions.
Community-level follow-up effects (not monetised)	Excluded from valuation	Assumption: Positive contextual effects were identified at community level, but these were not monetised in order to maintain a conservative approach.	Stakeholder interviews and project implementation records.

Taken together, the adjustments across the four factors transform gross outcome values into robust and defensible **net impacts**.

Table 13 Summary of Stakeholder Outcome Values

Stakeholder	Outcome	Gross Value (THB)	Deadweight	Displacement	Attribution	Drop-off / Year	Net Impact (THB)	Impact Duration
S1.1a Patients aged 0–3 years	Reduced developmental delays	1,018,878.75	0%	0%	25%	33%	602,958.70	4 Years (2023–2028)
S1.1b Patients aged 3–12 years	Reduced developmental delays (50% allocation of transitional subgroup)	965,007.00	0%	0%	25%	33%	571,078.13	4 Years (2023–2028)
S1.1b Patients aged 3–12 years	Increased confidence and social participation (50% allocation of transitional subgroup)	3,460,800.00	0%	0%	25%	33%	2,048,054.77	4 Years (2023–2028)
S1.1c Patients aged 12 years and above	Increased confidence and social participation	11,625,600.00	0%	0%	50%	33%	6,879,873.29	4 Years (2023–2028)
S1.2 Families of patients	Reduced stress and anxiety	75,061,200.00	0%	0%	50%	50%	55,661,324.64	2 Years (2023–2026)
S1.2.1 Families without travel/time compensation support	Time saved (visits & work absence)	3,108,447.84	0%	10%	0%	50%	4,149,102.12	2 Years (2023–2026)

Stakeholder	Outcome	Gross Value (THB)	Deadweight	Displacement	Attribution	Drop-off / Year	Net Impact (THB)	Impact Duration
S1.2.2 Families receiving travel/time compensation support	Time saved (visits & work absence)	646,409.40	0%	0%	50%	33%	532,429.00	2 Years (2023–2026)
S1.3 Maharaj Nakorn Chiang Mai Hospital, Faculty of Medicine, CMU	Increased staff satisfaction	4,952,316.00	0%	0%	25%	33%	8,792,141.46	4 Years (2023–2028)
S1.4 Ministry of Public Health	Knowledge gains	217,200.00	0%	0%	60%	33%	220,914.24	4 Years (2023–2028)
S1.4 Ministry of Public Health	Reduced coordination time	600,000.52	0%	0%	30%	33%	994,202.20	4 Years (2023–2028)
S1.4 Ministry of Public Health	Reduced follow-up time	600,000.52	0%	0%	0%	33%	1,420,288.86	4 Years (2023–2028)
S1.6 Provincial Public Health Offices (PHOs)	Strengthened collaboration	66,812.00	0%	0%	40%	33%	94,892.26	4 Years (2023–2028)
S2.1 Craniofacial Center, Chiang Mai University (SCFC)	Institutional reputation	17,703,080.00	0%	0%	0%	0%	17,703,080.00	1 Year (2023–2025)

Stakeholder	Outcome	Gross Value (THB)	Deadweight	Displacement	Attribution	Drop-off / Year	Net Impact (THB)	Impact Duration
S4 External Partners (NGOs, foundations, and health partners)	Strengthened collaborative networks	66,812.00	0%	0%	0%	33%	158,153.76	4 Years (2023–2028)
Total Value (Present Value)							99,828,493.43	

Note on Impact Duration and Calculation Window:

1) **Definition of "4 Years":** To ensure transparency and replicability, the **4-year duration** specified in this analysis encompasses the **3-year project implementation cycle (2023–2025)**, which is treated as the **Base Period (Year 1)** of social value creation, followed by **3 subsequent years (2026–2028)** during which the outcomes are sustained.

2) **Value Creation Horizon:** Consequently, the total social value of **THB 99,828,493.43**represents the cumulative present value projected across a **6-calendar-year horizon (2023–2028)**.

3) **Discounting and Adjustments:** All future benefits beyond the base period have been adjusted for an annual **drop-off rate** (reflecting the natural decline of impact) and **discounted at 3.5%** to reflect their current worth.

4) Patients aged 3–12 years are treated as a transitional subgroup in which both developmental and social-participation-related changes may be relevant. For valuation purposes, the quantity of this subgroup is allocated 50:50 across the two material outcomes. This does not imply that every patient in this age group experienced both outcomes equally; rather, it reflects a conservative allocation rule applied at the subgroup level to avoid uniform or overlapping outcome scaling.

Data Confidence and Risk Assessment

To ensure the reliability of the valuation, a data confidence assessment was conducted for each outcome. Confidence levels were evaluated based on (1) the quality and completeness of data sources, (2) the strength of stakeholder evidence, and (3) the robustness of valuation proxies. Outcomes supported by clinical records, digital monitoring systems, and multiple stakeholder interviews were assigned high confidence, while outcomes relying mainly on self-reported perception or smaller sample sizes were assigned moderate confidence. No outcomes with low data confidence were included in the valuation to avoid overclaiming.

Section 4: Calculating the Social Return on Investment (SROI)

Table 14 provides an overview of the project's total investment, the value of outcomes generated, and the resulting Social Return on Investment (SROI). The project invested THB 22,806,475.62 across the 2023–2025 period, covering personnel costs, development of digital systems, patient follow-up activities, training, workshops, and administrative expenses. These inputs generated a total gross outcome value of THB 101,014,598.92, representing the full unadjusted benefits experienced by patients, families, healthcare professionals, provincial health offices, and external partners.

After applying standard SROI impact adjustments—deadweight, displacement, attribution, and drop-off—and discounting future values using a 3.5% discount rate, the total net social value generated by the project amounts to THB 99,828,493.43 in present value terms. Based on this, the project achieved an SROI ratio of 4.38, indicating that every 1 THB invested generated approximately 4.38 THB in social value.

Table 14 Summary of Inputs, Outcomes, Net Social Value, and SROI Ratio

Component	Description	Value (THB)
Total Inputs (Investment)	Total cumulative financial resources invested over the full 3-year project cycle (2023–2025), including personnel costs, digital system development, patient follow-up, training, workshops, and administration.	22,806,475.62
Total Gross Outcome Value	Total unadjusted value of all outcomes generated across patients, families, healthcare personnel, public health offices, and external partners.	101,014,598.92
Total Net Impact (Present Value)	Total social value after all adjustments and discounted at 3.5% to reflect Present Value (PV).	99,828,493.43
SROI Ratio	Present Value of Benefits / Total Inputs.	**4.38**

Note: All values reported in this table are expressed in Present Value (PV) using a 3.5% discount rate, consistent with SROI methodology and Social Value International standards.

Table 15 and Figure 13 summarise how the project's net social value is distributed across different stakeholder groups. The largest share of benefits accrues to families of patients, representing 60.45% of total net impact, primarily through reduced stress, time savings, and fewer financial burdens. Patients themselves receive 10.12% of total benefits in the form of improved developmental outcomes and increased social confidence. The CMU Craniofacial Center accounts for 17.73%**,** reflecting enhanced institutional reputation and strengthened organisational capacity. Healthcare providers also benefit: Maharaj Nakorn Chiang Mai Hospital contributes 8.81%**,** while Ministry of Public Health hospitals receive 2.64% through improved coordination efficiency and reduced patient follow-up time. Provincial Public Health Offices and external partners receive smaller but meaningful shares associated with network strengthening.

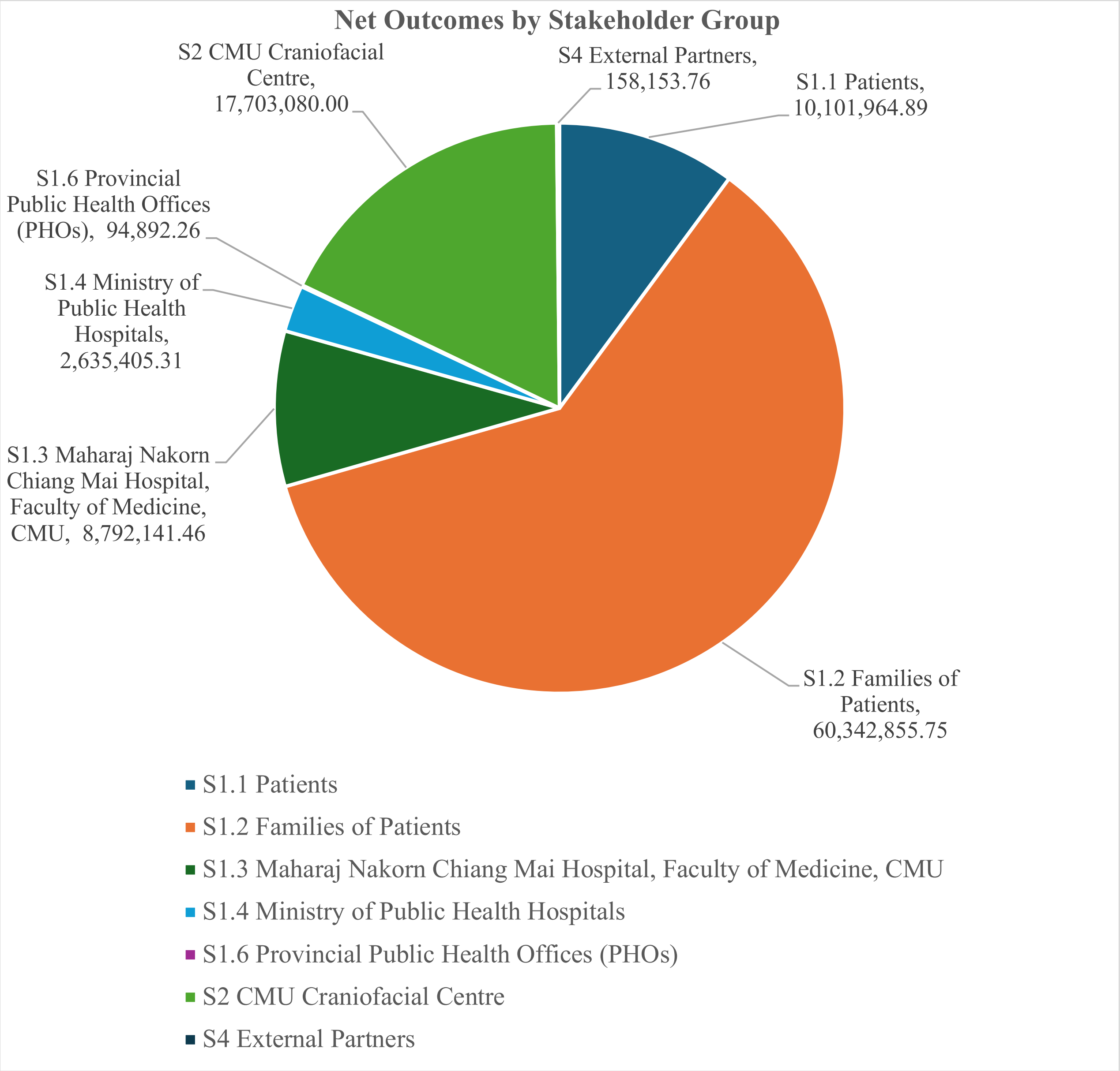
Table 15 Summary of Net Outcomes by Stakeholder Group

Stakeholder Group	Key Outcomes	Net Impact Value (THB, PV)	Share of Total (%)
S1.1 Patients	• Reduced developmental delays • Increased confidence and social participation	10,101,964.89	10.12
S1.2 Families of Patients	• Reduced stress, and anxiety • Time saved (visits & work absence)	60,342,855.75	60.45
S1.3 Maharaj Nakorn Chiang Mai Hospital, Faculty of Medicine, CMU	• Increased staff satisfaction	8,792,141.46	8.81
S1.4 Ministry of Public Health Hospitals	• Knowledge gains among Ministry of Public Health hospital staff • Reduced coordination time • Reduced follow-up time	2,635,405.31	2.64
S1.6 Provincial Public Health Offices (PHOs)	• Strengthened collaboration	94,892.26	0.10
S2.1 Craniofacial Center, Chiang Mai University (SCFC)	• Institutional reputation	17,703,080.00	17.73

Stakeholder Group	Key Outcomes	Net Impact Value (THB, PV)	Share of Total (%)
S4 External Partners (NGOs, foundations, and health partners)	• Strengthened collaborative networks	158,153.76	0.16
Total Net Impact (Present Value)		99,828,493.43	100.00

Note on Value Calculation: The Total Net Impact value of **THB 99,828,493.43** represents the cumulative social value generated over a **6-year horizon (2023–2028)**. This period encompasses the 3-year active project implementation (2023–2025) and the sustained benefits (Duration of Outcomes) observed for up to three years following project completion. All future values are adjusted for drop-off rates and discounted at 3.5% to reflect their Present Value (PV) as of 2023.

Figure 13 Net Outcomes by Stakeholder Group



Section 5: Sensitivity Analysis

5.1 Overview and Purpose

The sensitivity analysis assesses how changes in key assumptions affect the final SROI ratio. Because SROI calculations rely on several parameters—including attribution, drop-off, valuation proxies, and total investment—it is essential to test the robustness of the results under alternative scenarios.

To ensure maximum transparency, this section differentiates between **Macro-Level (General)** testing, which affects the project as a whole, and **Granular Outcome-Level** testing, which focuses on the specific stakeholders and variables that drive the most significant value.

5.2 Macro-Level Sensitivity Testing (General Scenarios)

Macro-level testing evaluates the impact of broad changes in investment costs and global adjustments. This level of analysis confirms the overall resilience of the project's value proposition. To reflect uncertainty arising from the small qualitative sample, the sensitivity analysis includes lower-uptake scenarios in which only 75% and 50% of the assumed beneficiaries are treated as experiencing the identified outcomes. These scenarios are intended to test the robustness of the SROI ratio under more conservative assumptions about the scale of outcome occurrence. For transparency, all macro-level sensitivity scenarios should be interpreted against the same base-case structure used in the final SROI calculation. Where an earlier draft table or intermediate model extract used a different investment base, those figures were retained only as working calculations and should not be interpreted as the final reference case. In the final report, scenario testing is intended to show how the SROI ratio changes when key assumptions are varied relative to the final investment and impact assumptions used in the base-case model. The interpretation of each scenario should therefore be read in relation to the final base-case ratio, rather than as a standalone recalculation from an alternative draft input base. Table 16 summarizes the impact of changing broad assumptions across all outcomes:

Table 16: General Project-Wide Sensitivity Scenarios

Scenario Tested	Assumption Changed	Original Value	Adjusted Value	Revised SROI Ratio	Interpretation
Base Case (Reference)	All impact adjustments as calculated			**4.38 : 1**	Reference scenario used for final SROI ratio
1. Higher Attribution	Attribution for all outcomes increased by +10%	0–60%	10–70%	3.64 : 1	SROI decreases moderately; The project remains impactful even when external partners are credited more.
2. Lower Attribution	Attribution for all outcomes reduced by –10%	0–60%	0–50%	5.02 : 1	SROI increases; project credited with more of the observed change
3. Higher Drop-off	Increase annual drop-off by +10 percentage points	33–50%	43–60%	4.07 : 1	Long-term outcomes weaken, but SROI remains above international benchmarks
4. Lower Drop-off	Decrease annual drop-off by –10 percentage points	33–50%	23–40%	4.71 : 1	Improved retention of outcomes strengthens overall social value
6. Increased Project Costs	Increase total inputs (investment) by +20%	17.17M THB	20.61M THB	3.65 : 1	Higher investment reduces the SROI ratio, but the project continues to generate substantial social value under a more conservative cost assumption.
7. Decreased Project Costs	Reduce total inputs by –20%	17.17M THB	13.74M THB	5.47 : 1	SROI increases sharply with lower investment cost

Scenario Tested	Assumption Changed	Original Value	Adjusted Value	Revised SROI Ratio	Interpretation
8. 50% uptake	Only **50%** of the currently assumed number of beneficiaries experience the outcome		Impact = 64.61M THB	2.83:1	The SROI ratio falls to 2.83:1 under the assumption that only 50% of the assumed beneficiaries experience the outcomes. This provides a lower-bound test of the model and shows that the project still generates positive social value even under a substantially more conservative uptake assumption.
9. 75% uptake	Only **75%** of the currently assumed number of beneficiaries are treated as experiencing the identified outcomes		Impact = 82.21M THB	3.60:1	The SROI ratio falls to 3.60:1 when only 75% of the assumed beneficiaries are treated as experiencing the outcomes. This indicates that the project remains robust and continues to generate positive social value under a moderately reduced uptake assumption.

Table 16 presents the results of the sensitivity analysis conducted to assess how changes in key assumptions affect the SROI ratio. The sensitivity analysis results illustrate that the project's Social Return on Investment (SROI) is exceptionally stable, maintaining a high value-for-money profile even when subjected to rigorous stress tests. Starting from a strong Base Case of 4.38:1, the analysis explores various "what-if" scenarios to ensure that the reported social value is not merely a result of overly optimistic assumptions. For instance, when testing for Attribution—which accounts for the contribution of other partners or external factors—even an increase of 10%

in their credit only moves the ratio to 3.64:1. This confirms that the project itself remains the primary driver of change and stays impactful even when the model is adjusted to be more conservative in crediting the project's specific intervention.

Furthermore, the data reveals that the project's total social value is highly sensitive to the longevity of its benefits, known as the Drop-off rate. When the retention of outcomes is improved (Scenario 4: Lower Drop-off), the SROI climbs to its peak of 4.71:1, suggesting that strategies focusing on the sustainability of results for participants are the most effective way to maximize total social impact. Even in the face of financial fluctuations, such as a 20% increase in investment costs, the ratio remains robust at 3.65:1, comfortably exceeding the standard benchmark of 4.38:1 often used in social investment to denote high performance. Collectively, these scenarios demonstrate that the project is not only high-performing but also financially resilient, providing a solid evidence base for stakeholders and evaluators that the social impact can withstand significant changes in operational and financial variables.

To address this uncertainty, the sensitivity analysis includes lower-uptake scenarios in which only 75% and 50% of the assumed beneficiary numbers are treated as experiencing the identified outcomes. This scenario assumes that only 75% of the currently assumed number of beneficiaries experience the identified outcomes. Under this more conservative assumption, the total impact decreases to **THB 82.21 million**, and the SROI ratio falls to **3.60:1**. Although lower than the base-case result, the ratio remains comfortably above 1:1, indicating that the project continues to generate substantial positive social value. This finding strengthens confidence in the robustness of the SROI result under moderate reductions in stakeholder uptake. For 50% uptake, this scenario assumes that only half of the currently assumed number of beneficiaries actually experience the identified outcomes. Under this stricter assumption, the total impact falls to THB 64.61 million, and the SROI ratio declines to 2.83:1. The result shows that the model is sensitive to assumptions about beneficiary uptake; however, the project still generates positive social value well above the break-even point. This suggests that even if the scale of outcome occurrence is substantially lower than assumed in the base case, the project remains socially worthwhile.

5.3 Granular Outcome-Level Sensitivity Testing (All Stakeholder Groups)

To address the requirement for transparency at the outcome level, targeted tests were conducted across all material stakeholders. This ensures that the results are not overly dependent on a single variable or a single group.

Table 17: Specific Outcome-Level Sensitivity Testing Across All Stakeholders

Stakeholder Group	Outcome Variable Tested	Base Case Value	Sensitivity Value	Revised SROI
S1.1 Patients	Duration: Reduced developmental delays	4 Years	2 Years	4.28 : 1
S1.1 Patients	Deadweight: Reduced developmental delays	0%	10%	4.33 : 1
S1.2 Families	Proxy: Reduced stress and anxiety	1,775 THB	1,000 THB	3.31 : 1
S1.2 Families	Attribution: Reduced stress and anxiety	50%	75%	3.15 : 1
S1.2 Families	Displacement: Time saved (visits & work absence)	10%	20%	4.36 : 1
S1.3 Maharaj Nakorn Chiang Mai Hospital, Faculty of Medicine, CMU	Attribution: Increased staff satisfaction	25%	75%	4.12 : 1
S1.4 MoPH Hospitals	Proxy: Reduced coordination time / Reduced follow-up time	236.78 THB/day	118 THB/day	4.32 : 1
S1.6 Provincial Public Health Offices (PHOs)	Attribution: Strengthened collaboration	40%	80%	4.37 : 1
S2.1 Craniofacial Center, Chiang Mai University (SCFC)	Duration: Institutional reputation	1 Year	0.5 Year	3.99 : 1

Table 17 represents a "stress test" for the Base Case SROI of 4.38: 1. While macro-level testing looks at the project as a whole, this granular analysis isolates key variables within each stakeholder group to test whether the social value remains robust even under conservative or less-than-ideal conditions.

For S1.1 Patients (Reduced developmental delays), the sensitivity analysis examined both deadweight and duration assumptions. First, deadweight was increased from 0% to 10% to reflect the possibility that a small share of clinical outcomes might occur naturally without the programme; even under this conservative scenario, the SROI remained strong at 4.33 : 1, confirming that the intervention is the main driver of change. Second, the duration of reduced developmental delays was reduced from 4 years to 2 years, producing an SROI of 4.28 : 1, which indicates that the project continues to generate substantial social value even if long-term clinical effects are less persistent than initially projected.

For S1.2 Families (Reduced stress and anxiety and saved travel time and reduced work absence), the analysis tested displacement, as well as the valuation and attribution of benefits, given that this group represents the largest value driver (56.60% of total impact). Displacement was increased from 10% to 20% to account for potential disruptions from home-based care routines; the SROI remained stable at 4.36:1, suggesting that the time and cost savings from reduced hospital travel significantly outweigh any additional burden on families. In the more stringent tests, the proxy value for stress relief was reduced from THB 1,775 to THB 1,000, and attribution to external support was increased to 75%, resulting in revised SROI values between 3.15:1 and 3.31:1. While these adjustments represent the most sensitive area of the analysis, the SROI remains well above the breakeven point, supporting the robustness and defensibility of the family-related impact claim.

For S1.3 Maharaj Nakorn Chiang Mai Hospital (Increased staff satisfaction), the test increases attribution to other contributing factors from 25% to 75% to examine whether staff pride and job satisfaction are primarily explained by individual capability rather than the programme's systems and support. The revised SROI remains high at 4.12: 1, suggesting that even when a much larger share of impact is attributed away from the programme, the overall SROI is still stable.

For S1.4 Ministry of Public Health Hospitals (Reduced coordination time / Reduced follow-up time**)**, the proxy value for time saved is reduced by 50% from THB 236.78/day to THB

118/day, reflecting a conservative valuation of wage-based efficiency gains for Ministry of Public Health hospitals within the network. This adjustment yields a revised SROI of 4.32: 1, implying that reasonable variations in the valuation of time savings have only a limited effect on the overall ratio.

For S1.6 Provincial Public Health Offices (PHOs) (**Strengthened networks**), the sensitivity test increases attribution to external network factors from 40% to 80%, reflecting the assumption that existing provincial structures and relationships account for most of the observed network strengthening rather than the programme. Even under this highly conservative attribution, the revised SROI remains 4.37:1, indicating that the SROI result is resilient to attribution uncertainty in this outcome area.

For S2.1 Craniofacial Center, Chiang Mai University (SCFC) (Institutional reputation), the duration of institutional reputation and credibility is reduced from 1 year to 0.5 year, testing a short-lived institutional benefit scenario. The revised SROI remains 3.99: 1, demonstrating that the overall value is not overly dependent on prolonged institutional recognition effects.

The sensitivity analysis indicates that, even when key assumptions for each stakeholder group are adjusted to more conservative values (e.g., shortening outcome duration, reducing proxy values, and increasing attribution to external factors), the revised SROI remains **within the range of 3.15: 1 to 4.37 : 1**. This demonstrates that the programme delivers clear social value and that the overall results are **robust** to uncertainty in the most influential assumptions. The largest reduction in SROI occurs for **Families (S1.2)** when the **stress-relief proxy is lowered** or when **attribution to external support is increased**, resulting in an SROI of **3.15-3.36 : 1**. In contrast, sensitivity tests for other stakeholder groups—such as halving the time-saved proxy for Ministry of Public Health hospitals, increasing attribution for provincial network strengthening, and shortening the duration of institutional reputation benefits—produce only minor changes, with SROI remaining approximately **4.12-4.32 : 1**. Overall, the findings suggest that the SROI is not driven by a single assumption but is supported by multiple value pathways.

5.4 Professional Judgement and Risk Mitigation

In addition to the formal impact adjustments applied in the SROI model, the evaluation also considered the potential risk of error, bias, and uncertainty in the data and findings. These risks include retrospective recall bias, uncertainty arising from a small qualitative sample, variation in subgroup experiences, incomplete population-level verification, and the possibility that some assumptions may overstate the scale or persistence of outcomes. Where relevant, the report addresses these risks through explicit risk-mitigation measures, including conservative proxy selection, higher attribution or drop-off rates, subgroup separation where material, outcome de-duplication, strict valuation boundaries, triangulation of qualitative and administrative evidence, and sensitivity analysis.

To address the risk of error, bias, and uncertainty, the project team highlights the following professional judgements and risk-mitigation measures used throughout the SROI analysis:

- **Handling Recall Bias**: For family stress data gathered via retrospective recall, the analysis applied a **high 50% attribution rate** and a **50% drop-off rate** as a risk-mitigation measure. This was intended to reduce the risk that recalled improvements in stress and anxiety might be overstated.
- **Conservative Proxy Selection**: Whenever multiple proxies were available, the **lowest reasonable estimate** was selected (e.g., regional minimum wage) to avoid overclaiming social value. This was used as a direct mitigation measure against valuation error and overstatement.
- **De-duplication of Benefits**: Judgement was used to **merge "improved physical appearance" into "increased confidence and social participation."** Counting both separately would result in double-counting the same clinical change. This was done to reduce the risk of inflating outcome values through overlapping valuation.
- **Counterfactual (Deadweight) Judgement**: A 0% deadweight was applied based on clinical evidence that craniofacial conditions do not resolve spontaneously and historical data showing treatment abandonment prior to the network's establishment. This judgement was supported by clinical and historical evidence in order to reduce the risk of under- or over-estimating the true counterfactual.
- **Strict Inclusion Criteria**: To address potential variation in the wider population, the valuation included only eligible beneficiaries within the project's defined valuation boundary and recorded care system, excluding cases outside the scope or lacking

sufficient evidence of project-linked change, to ensure the claimed impact is defensible. This was intended to reduce the risk of over-scaling outcomes beyond the defensible evidence base.

- **Triangulation of Evidence:** Professional judgement was applied together with stakeholder interviews, clinical records, ThaiCleftLink data, workflow evidence, and project documentation in order to strengthen the credibility of outcome measurement and reduce reliance on any single source of evidence. This was used to mitigate the risk of error arising from incomplete, subjective, or single-source evidence.

Taken together, these measures were used not only to improve methodological transparency, but also to reduce the risk of over-claiming and to reflect uncertainty where the evidence base was limited or potentially variable across the wider stakeholder population.

Section 6: Stakeholder Verification Process

To comply with Social Value International's Principle 7: *Verify the Result*, the evaluation incorporated a stakeholder verification process to ensure that the Theory of Change, identified outcomes, key assumptions, attribution, duration, and estimated impact values reflect the real experiences of those affected by the project. Verification activities were conducted in two stages: (1) verification of material outcomes and assumptions with relevant stakeholder representatives, and (2) planning for ongoing verification in future phases. Due to budget and time constraints, the verification process was prioritized for primary stakeholder groups who experienced the most significant and material changes. This targeted approach ensured that the most material outcome statements, assumptions, and interpretations of change were reviewed and confirmed by representative stakeholders, thereby strengthening the credibility, transparency, and overall robustness of the results.

6.1 Verification of Outcome Evidence and Valuation

Stakeholders were asked to review key outcome statements and valuation assumptions to confirm whether:

- the described changes were accurate,
- the magnitude of change seemed reasonable, and
- the financial proxies reflected their perceived value.

Specific verifications included:

- Caregivers confirming that reductions in stress and reduced travel burden were represented accurately.
- Medical staff validating workflow and coordination improvements, including time saved in patient tracking.
- MoPH hospitals confirming that knowledge gained from training sessions was applied continuously.

Where needed, clarifications were made to the duration and attribution assumptions. For example, attribution percentages for family stress reduction were refined after additional stakeholder feedback.

Crucially, this stakeholder engagement served as a final triangulation step to validate the level of change. By presenting the preliminary findings—derived from clinical indicators and administrative records—back to the stakeholders, the project confirmed that the calculated values aligned with their actual lived experiences. This process ensured that the multiple indicators used throughout the analysis (e.g., hospital logs, development scales, and staff reports) accurately reflected the magnitude of impact, thereby minimizing the risk of overclaiming.

6.2. Future Verification Plan

As this report uses evaluative data for the 2023–2025 period, the project team has developed a plan to continue verifying actual outcomes in future phases:

- Annual stakeholder consultations will be conducted to compare projected and actual outcomes.

- Provincial network meetings will be used as a platform for reviewing updated outcome data and identifying potential new outcomes.
- Any changes in assumptions—such as duration, drop-off, or attribution—will be reevaluated collaboratively with stakeholder groups.
- Results will be documented in future SROI updates to maintain accuracy and transparency.

This verification plan ensures that stakeholder perspectives remain central to the evaluation process and that future SROI studies can be benchmarked against the findings of this report.

Section 7: Recommendations and Limitations of the Evaluation

7.1 Recommendations from the Economic and Social Impact Assessment

The assessment of the economic and social impacts of the Sustainable Healthcare System driven by the Data from Functional Health Care Organizations and IT Platform of Network for Health Care Providers Implementation to Upper Northern Thailand, implemented by The Princess Sirindhorn IT Foundation Craniofacial Center, Chiang Mai University (SCFC), indicates that the greatest social value is realised by patients and their families, alongside enhanced institutional reputation and capacity development for the Center and partner hospitals. Based on consultations with stakeholders across all levels of the project, several recommendations have been identified to further strengthen the initiative in future phases. These recommendations fall into three interrelated domains:

7.1.1 Recommendations Related to Research on Treatment and Prevention

1) **Conduct in-depth preventive research:** Stakeholders suggested that further research should be undertaken to identify preventive measures for congenital craniofacial conditions in future newborns.

2) **Genetic research on underlying causes:** Expanding research on genetic or DNA-related factors associated with craniofacial anomalies may help improve early detection and long-term treatment strategies.

3) **Non-surgical facial correction options:** Explore the use of face masks or similar devices as non-surgical alternatives for correcting certain craniofacial abnormalities.

7.1.2 Recommendations Related to Technology

1) **Reduce waiting times for prosthetic or supportive devices:** Stakeholders expressed the need to shorten the waiting period for items such as palatal obturators, which presently require families to incur additional costs for accommodation, travel, or postal delivery.

2) **Expand telemedicine services:** Increasing the use of telehealth could reduce unnecessary travel and improve continuity of care.

3) **Develop an appointment and queue management application:** A mobile application for scheduling and rescheduling appointments would enhance convenience for patients and caregivers.

4) **Provide accessible online self-care knowledge:** Educational materials on basic patient care should be made available through mobile-friendly platforms to facilitate easier access for families.

7.1.3 Recommendations Related to Collaboration

1) **Expand inter-university collaboration:** Strengthening partnerships between Chiang Mai University and other universities—such as Naresuan University—could broaden clinical and research capacity.

2) **Extend the hospital network beyond the eight northern provinces:** Collaboration could be expanded to remote hospitals such as Omkoi Hospital, Mae Chaem Hospital, and Doi Tao Hospital, as well as hospitals in other regions of Thailand.

3) **Increase outreach to Subdistrict Health Promoting Hospitals (SHPHs) and village health volunteers (VHVs):** Stakeholders recommended more frequent visits, training activities, and capacity-building support for local health personnel.

4) **Consider treatment rights or special funding for patients aged 18 and above:** Some families expressed challenges related to treatment coverage once patients reach adulthood.

5) **Improve coordination mechanisms between hospitals and the Center:** Establishing a dedicated coordination unit could streamline communication and reduce operational burdens.

7.2 Limitations and Risk Assessment of Potential Errors

In line with SVI assurance principles, this section considers not only the substantive limitations of the evaluation but also the potential risks of error, bias, uncertainty, and over-claiming in the data, assumptions, and valuation model. Where relevant, conservative assumptions were applied explicitly as risk-mitigation measures, rather than as neutral technical choices, in order to strengthen the defensibility of the findings.

7.2.1 Data Availability and Completeness: While the project maintains a clinical database, some historical data regarding family financial baselines prior to treatment were derived partly from retrospective recall during interviews. This introduces a potential recall bias, although triangulation with hospital records and other administrative evidence was used as a risk-mitigation measure to reduce this risk.

7.2.2 Sample Size and Generalization: The SROI analysis relies on deep qualitative data from a stratified sample of 13 patient families (representing 0.5% of the total population). While data saturation was achieved and subgroups were analyzed to ensure representativeness, there is a limitation in statistically generalizing these findings to the entire population of 2,643 patients without a larger quantitative survey. A key limitation of the evaluation is the small qualitative sample relative to the full beneficiary population. Although the sample was intentionally constructed to achieve analytical representativeness across key subgroups, it should not be interpreted as statistically representative of all beneficiaries. This creates a risk that the scale, distribution, and intensity of outcomes in the wider population may differ from those observed in the interviewed sample. For this reason, outcome scaling should be interpreted cautiously and tested through sensitivity analysis, including lower-uptake scenarios in which only 75% and 50% of the assumed beneficiaries are treated as experiencing the identified outcomes.

7.2.3 Aggregation of Subgroups: As discussed in Section 1.2, the evaluation recognises that some stakeholder groups, particularly patients and families, are internally heterogeneous and may experience different forms, timing, and intensity of change.

Although some results are still presented within a common stakeholder family for reporting clarity, the valuation structure retains subgroup distinctions more explicitly where these materially affect the quantity, dominant form, or practical significance of value created. This is particularly relevant for patient developmental-stage subgroups and for family subgroups defined by travel/time compensation status.

For patients, the evaluation found that the broad direction of change was positive across the sample, but the dominant form of value created was not uniform across all ages. Earlier-stage patients were linked more strongly to reduced developmental delays, whereas older patients were linked more strongly to increased confidence and social participation. The 3–12 year group was treated as a transitional subgroup in which these forms of change could overlap. For this reason, the analysis does not rely solely on a single undifferentiated patient average. Instead, subgroup distinctions are retained where they materially affect the interpretation and scaling of outcomes.

This approach helps reduce the risk that subgroup variation is obscured by aggregated averages. At the same time, the report recognises that some residual aggregation remains necessary for reporting and modelling purposes, and that this may still mask differences in intensity, timing, or pathway of change among certain subgroups, especially **complex craniofacial cases** relative to more standard cleft conditions. To address this limitation, conservative assumptions were applied and subgroup distinctions were retained explicitly where they materially affected the form or quantity of value created.

7.2.4 Valuation and Financial Proxies: Since many outcomes are intangible (e.g., confidence, reduced stress), financial proxies were used to estimate value. For instance, the cost of "depression treatment" was used as a proxy for "reduced parental stress." These are approximations and may not fully capture the subjective value experienced by every individual family. For this reason, proxy selection was treated conservatively and is interpreted as a defensible valuation basis rather than a precise measure of personal experience.

7.2.5 Assumption of Positive Change in the Wider Population and Non-Respondents: The SROI calculation applies the positive outcomes observed in the representative sample (n=13) to the total eligible population. However, we acknowledge a limitation regarding the potential for variation among non-sampled beneficiaries or partial participants. While 100% of the sampled stakeholders reported positive changes, it is possible that a segment of the wider population may have experienced no material change, weaker change, or different forms of change due to individual constraints, treatment stage, clinical complexity, or support context. This should not be interpreted to mean that every member of the wider beneficiary population experienced the same outcome, the same intensity of outcome, or any material outcome at all within the observation period. The qualitative sample was designed to identify and understand material pathways of change, not to estimate a statistically uniform response rate across the full beneficiary population. For this reason, the scaling of outcomes from the interviewed sample to the wider population was treated as an analytical and conservative exercise rather than a claim of full population equivalence. This limitation is one reason why the report applies explicit subgroup distinctions, conservative quantity logic, and lower-uptake sensitivity scenarios.

Mitigation Strategy: To address the risk of overestimating the impact for this unknown group, the analysis adopted a **conservative approach**:

1) **Strict Inclusion Criteria:** Only patients actively recorded in the database and receiving services were included (excluding inactive or unreachable cases who are more likely to experience "no change").

2) **Sensitivity Analysis: The analysis tested lower-uptake scenarios in which only 75% and 50% of the assumed beneficiaries are treated as experiencing the identified outcomes**, to ensure that even if the impact on the wider group is lower than the sample, the SROI ratio remains robust.

3) **Conservative Assumptions:** Applied to financial proxies to ensure the claimed social value remains defensible and not overstated.

7.2.6 Risk of Over-claiming and Mitigation

To address the risk of over-claiming social value, this assessment adhered to a strict principle of conservatism throughout the valuation process. Several mitigation strategies were applied to ensure that the SROI result remained proportionate to the underlying evidence base.

First, **strict inclusion criteria** were applied so that only stakeholder groups and outcomes with sufficient evidence, material relevance, and a defensible causal connection to the project were taken forward into valuation. Stakeholder groups for which evidence was inconsistent, limited in scale, or secondary in significance were excluded from monetisation. For example, although positive outcomes were identified for **SHPHs and VHVs**, these outcomes were not included in the financial calculation because the evidence was not sufficiently consistent and the scale of impact was limited relative to the primary valued outcomes.

Second, **conservative proxy selection** was used wherever more than one reasonable financial proxy was available. For example, family time savings were valued using the **Northern Region minimum wage** rather than a higher national or average income benchmark. This approach was intended to reduce the possibility that monetised values would exceed the defensible economic significance of the changes observed.

Third, the valuation model incorporated impact adjustments and sensitivity analysis to test the robustness of results under more conservative assumptions. As shown in the sensitivity analysis section, the model was stress-tested by increasing attribution, increasing annual drop-off, increasing project costs, and applying lower-uptake scenarios in which only 75% and 50% of the assumed beneficiaries were treated as experiencing the identified outcomes. Even under these more conservative assumptions, the SROI ratio remained positive, indicating that the project continued to generate social value.

Taken together, these measures reduce the risk that the analysis attributes too much value to the project, applies outcomes too widely across the beneficiary population, or relies too heavily on optimistic assumptions where evidence is incomplete.

7.2.7 Avoidance of Double Counting Potential double counting was rigorously identified and managed during the 'Outcome Mapping' phase. Specific de-duplication measures included:

1) **Merging Intermediate Outcomes:** Stakeholders initially identified 'Improved Physical Appearance' and 'Better Speech' as separate benefits. However, the analysis determined that these were merely the mechanisms leading to the ultimate benefit of

'Social Confidence.' Therefore, only **'Increased confidence and social participation'** was valued to prevent counting the same change twice.

2) **Separating Donor vs. Beneficiary Benefits:** While Operation Smile (the funder) achieved 'Strategic Goals,' this was excluded from the social value calculation because their financial input was the enabler for the patients' outcomes. Counting both the funding success and the patient success would have duplicated the value of the same investment.

3) **Valuing End Outcomes:** We valued the actual change experienced (e.g., developmental progress) rather than the inputs (e.g., number of surgeries performed), ensuring the value reflects impact rather than activity volume.

7.2.8 Limitations in Constructing the Chain of Events

The chains of events presented in this report were developed from stakeholder interviews, project records, and supporting administrative evidence, and were further interpreted through the professional judgement of the evaluators. Although this approach is appropriate for SROI analysis, some causal links remain inferential rather than experimentally verified, particularly where complete case-level data were not available for every stakeholder subgroup. For this reason, the chains should be understood as evidence-based and plausible representations of how change occurred, rather than as definitive proof of causality in every case.

7.3 Statement of Key Professional Judgements

To ensure the robustness and transparency of the findings, specific professional judgements were applied to key decision points in the analysis. These judgements were guided by the **principle of conservatism** and supported by empirical evidence.

7.3.1 Judgements on Outcome Selection (Materiality)

- **Merging Intermediate Outcomes:** Stakeholders initially identified "improved physical appearance" and "better speech" as separate benefits. A professional judgement was made to merge these into the final outcome of **"Increased confidence and social participation"** to prevent double-counting the mechanism (physical change) and the result (confidence and participation) separately.

- **Exclusion of Strategic Benefits:** While Operation Smile (Funder) achieved strategic goals, these were excluded from the social value calculation. The judgement was made that counting donor benefits alongside beneficiary benefits would duplicate the value of the investment.

7.3.2 Judgements on Financial Proxies (Valuation)

- **Selection of Minimum Wage:** For time-saving outcomes, the **Northern Region Minimum Wage (THB 236.78/day)** was selected instead of the higher national average. This judgement ensures the value reflects the specific economic reality of the beneficiaries in the 8 northern provinces and avoids overclaiming.
- **Proxy for Parental Stress:** The cost of **"outpatient depression treatment" (THB 1,775)** was chosen as a proxy for reduced parental stress. While stress is subjective, this judgement relies on the established standard from TDRI (2012) as the most defensible medical equivalent for significant mental health relief.

7.3.3 Judgements on Impact Adjustments

Specific professional judgements were applied to the impact-adjustment stage in order to ensure that the valuation remained **conservative**, **transparent**, and **aligned with the best available evidence**.

- **0% Deadweight for Reduced Developmental Delays:** A judgement of **0% deadweight** was applied to the clinically grounded patient outcome of **reduced developmental delays**. This was based on the clinical and historical evidence available to the evaluation team, which indicated that these developmental improvements were unlikely to have occurred spontaneously without timely treatment, continuity of care, and the coordinated service system created by the project. This judgement was therefore used to reflect the low plausibility of a meaningful counterfactual in the absence of the intervention.
- **Conservative Attribution for Family Stress Outcomes:** A relatively high **50% attribution** rate was applied to family outcomes relating to **reduced stress, anxiety, and concerns about the child's future**. This judgement recognises that family well-being is influenced by multiple external factors, including financial circumstances, household support, debt, and wider social conditions. The use of a relatively high attribution rate

therefore served not only as a technical adjustment, but also as a **risk-mitigation measure** to reduce the possibility of over-claiming.

- **Differentiated Attribution by Outcome Type:** Attribution assumptions were not applied uniformly across all outcomes. Instead, they were aligned with the nature of the change and the strength of the project's likely contribution. More clinically grounded outcomes and directly project-linked operational outcomes were treated differently from broader psychosocial or system-level outcomes where multiple actors or contextual factors may have contributed to the observed change.
- **Use of Drop-off to Reflect Declining Persistence of Change:** Annual **drop-off rates** were applied to reflect the likelihood that the value of some outcomes would decline over time rather than remain constant. This was particularly important for outcomes expected to weaken gradually after the most intensive phase of project support. Applying drop-off in this way reduced the risk of overstating long-term value by assuming that the initial intensity of benefit would persist unchanged throughout the full duration period.

Reference List

Government Regulations & Public Policy

- Comptroller General's Department. (2012). Ministry of Finance regulation on training expenses, organization of activities, and international conferences (No. 3) B.E. 2555.
- Ministry of Labour. (2024). *Notification of the Wage Committee: Minimum wage rates (No. 12) for Northern Thailand provinces*.
- Office of the Basic Education Commission (OBEC). (2024). *Annual government budget per person for student development activities (Early childhood to secondary levels)*.
- HM Treasury. (2022). *The Green Book: Central Government guidance on appraisal and evaluation*.

Academic Research & Social Impact Studies

- Chandduaywit, V. (2014). *Valuing social impact from life satisfaction: A shadow price approach*. Thailand Development Research Institute (TDRI).

- Sirikul, W., et al. (2025). *Retrospective analysis of the Northern Thailand Cleft Lip and Cleft Palate Healthcare Network: Impact on timely evaluation and treatment abandonment*.
- Thailand Development Research Institute (TDRI). (2012). *Social Return on Investment (SROI) assessment of health promotion and disease prevention projects for children and youth*.

Institutional & Project Data

- Craniofacial Center, Chiang Mai University. (2023). *Annual financial reports and budget allocation evidence*.
- Princess Sirindhorn IT Foundation. (2025). *ThaiCleftLink system logs: Data retrieval and patient follow-up duration records*.
- School of Lifelong Learning, Chiang Mai University. (2024). *Market cost for certified self-confidence and personality development training*.

International Standards

- Social Value International (SVI). (2024). *Standard standards for applying the principles of social value*.

Appendix 1: Stakeholder Engagement Methodology and Interview Questions

1. Purpose of Stakeholder Engagement

Stakeholder engagement was conducted to ensure that all material outcomes included in the SROI analysis accurately reflected the real experiences, priorities, and perceived changes among individuals and organisations affected by the Sustainable Healthcare System driven by the Data from Functional Health Care Organizations and IT Platform of Network for Health Care Providers Implementation to Upper Northern Thailand. Engagement activities informed:

- Identification of stakeholder groups
- Definition of outcomes and chains of events
- Selection of indicators and valuation proxies
- Determination of attribution, deadweight, displacement, and drop-off
- Verification of outcome relevance and materiality

2. Stakeholder Identification and Sampling Approach

2.1 Stakeholder Groups Included

Based on project documentation, consultations, and the ThaiCleftLink database, stakeholders most likely to experience material changes were identified as:

- Patients with cleft lip, cleft palate, and craniofacial conditions
- Families and caregivers
- Maharaj Nakorn Chiang Mai Hospital multidisciplinary teams
- Ministry of Public Health (MoPH) hospitals across 8 northern provinces
- Subdistrict Health Promoting Hospitals (SHPH) and Village Health Volunteers (VHVs)
- Provincial Public Health Offices (PHOs)
- Craniofacial Center, CMU
- External non-profit organisations and academic partners

2.2 Sampling Method

Purposive sampling was used to ensure diverse representation in terms of:

- Geographic areas (8 provinces)
- Patient age groups (infants, children, adolescents)
- Types of involvement (clinical care, follow-up, administrative coordination, system-level support)
- Professional disciplines (doctors, nurses, OTs, SLPs, social workers, administrators)

2.3 Number of Participants

A total of **40 stakeholders** participated:

Stakeholder Group	Number Interviewed
Patients	13
Families / Caregivers	13
CMU Multidisciplinary Team	3
MoPH Hospitals	4
SHPH/VHVs	2
PHOs	2
External Partners	3

This represents all key subgroups and provides a fair representation of stakeholder experiences.

3. Engagement Methods

3.1 Semi-Structured Interviews

Conducted individually with patients, caregivers, and professional personnel to explore:

- Lived experiences

- Perceived changes
- Challenges and unmet needs
- Contribution of the project compared to other factors
- Duration and sustainability of change

3.2 Small-Group Discussions

Used for hospital teams and PHOs to capture:

- Operational changes
- Workflow efficiency
- Use of the integrated digital system
- Professional learning and collaboration

3.3 Document and Data Review

Validated stakeholder statements with:

- ThaiCleftLink system usage data
- Appointment and follow-up logs
- Training participation lists
- Annual reports of the Craniofacial Center
- Provincial network meeting minutes

4. Use of Stakeholder Evidence in the SROI Process

4.1 Development of the Chain of Events

The chain of events for each stakeholder group was developed using multiple sources of evidence. These included semi-structured stakeholder interviews, project implementation records, administrative and clinical data, and relevant sector knowledge from previous research and practice in cleft lip, cleft palate, and craniofacial care. The causal links between activities, intermediate changes, and material outcomes were identified through thematic analysis of stakeholder experience and then reviewed by the evaluators using professional judgement to ensure that the pathways were plausible, consistent with the project design, and aligned with the evidence available. Where appropriate, the chains were refined to distinguish intermediate changes from the final well-defined outcomes taken forward for valuation.

4.2 Defining Outcomes

Interview results directly informed:

- Selection of material outcomes for each group
- Development of the Impact Pathway
- Identification of short-term and long-term outcomes

4.3 Establishing Impact Adjustments

Stakeholder responses guided the determination of:

Factor	Stakeholder Evidence Used
Deadweight	Stakeholders consistently reported that improvements would *not* have occurred without the project
Attribution	Stakeholders rated contribution of CMU, hospitals, families, and external actors
Displacement	Some families indicated minor shifts in household routines (→ 10% applied)
Drop-off	Stakeholders described when benefits persisted or declined

4.4 Materiality Decisions

Outcomes with limited evidence (e.g., SHPH/VHV minor-level follow-up outcomes) were excluded based on:

- Small scale
- Limited consistency
- Insufficient causal evidence

5. Interview Question Guide

The following question sets were used for all stakeholder groups. Questions were designed to be open-ended, allow identification of unexpected outcomes, and comply with SVI's requirement for capturing *intended, unintended, positive, and negative* outcomes.

5.1 Patients (Children / Adolescents)

1. How has the treatment and follow-up process changed your daily life?
2. What improvements have you noticed in your development, confidence, or ability to engage with others?
3. Are there any difficulties or negative experiences related to the services?
4. What changes do you think would have happened even without the project?
5. Who or what else contributed to the changes you experienced?
6. How long do you think these improvements will last for you?

5.2 Families / Caregivers

1. How has the project influenced your stress, worry, or confidence regarding your child's future?
2. Have your time, travel burden, or work absence changed?
3. Did anything unexpected or negative occur because of the project?
4. Did participating in this project require you to give up or reduce time spent on other important activities (e.g., work or other necessary treatments)?
5. Without this project, what do you think would have happened?
6. Who else helped generate these changes (family, local hospital, school, etc.)?
7. For how long do you expect the positive impacts to remain?

5.3 Maharaj Nakorn Chiang Mai Hospital Medical Team

1. What changes have occurred in your work practices or teamwork due to the project?
2. How has the project influenced your professional satisfaction or pride?

3. Are there inefficiencies or negative impacts on workload?
4. To what extent did the project directly cause these changes versus existing hospital systems?
5. How long will the benefits from training or coordination last?

5.4 Ministry of Public Health Hospitals

1. How has your hospital's workflow changed due to the multidisciplinary network?
2. What knowledge or skills did you gain from training, and how have you applied them?
3. What parts of the system would have improved even without the project?
4. How much additional coordination time was saved?
5. What factors contributed most to these improvements?
6. For how long do you expect these improvements to continue?

5.5 Subdistrict Health Promoting Hospitals (SHPH) / Village Health Volunteers

1. What is your role in patient monitoring and follow-up?
2. How has the project changed your work or the patient experience?
3. Did you encounter challenges or negative effects?
4. How much of the change is due to your effort versus the hospital network?
5. How long does this benefit last?

5.6 Provincial Public Health Offices

1. How has the project strengthened provincial coordination or academic networks?
2. What long-term benefits do you perceive at the system level?
3. What parts of the outcomes would have occurred anyway?
4. Which agencies contributed to these results?
5. How long will the networks and knowledge remain valuable?

5.7 Craniofacial Center, Chiang Mai University

1. How has the project affected the Center's institutional development and reputation?
2. Did the project generate unexpected opportunities or challenges?
3. To what extent is the increased budget or recognition attributable to the project?
4. How sustainable are the new systems and collaborations?

5.8 External Partner Organisations

1. How has collaboration with the Center changed through the project?
2. Did your organisation gain new networks, knowledge, or visibility?
3. Were there any negative or unintended outcomes?
4. How likely is it that these outcomes would have occurred without the project?
5. How long-lasting are these collaborative benefits?

6. Ethical Considerations

- Interviews involving minors were conducted with parental presence.
- Responses were anonymised to protect confidentiality.
- Data was used solely for the purpose of SROI analysis and quality assurance.