SUMMIT
Institute for Development

ANNUAL REPORT

SUMMIT

INSTITUTE FOR DEVELOPMENT

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https://www.sid-indonesia.org/
secretariat@sid-indonesia.org

Jl. Sultan Hasanuddin No. 137B, Kelurahan Karang Taliwang,
Kec. Cakranegara, Kota Mataram, Nusa Tenggara Barat 83238

ABBREVIATIONS

ANC	Antenatal Care
ANU	Australian National University
BAPELKES	Balai Pelatihan Kesehatan
BKKBN	Badan Kependudukan dan Keluarga Berencana Nasional
BPJS	Badan Penyelenggara Jaminan Sosial
CHP	Community Health Promoter
CHPC	Community Health Promoter Coordinator
CIFF	Children's Investment Fund Foundation
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DED	Digitally Enabled District
DHO	District Health Office
DRA	Digital Readiness Assessment
DTO	Digital Transformation Office
ECD	Early Childhood Development
EMAS	Expanding Maternal and Neonatal Survival
FHN	Family Health Nurse
FHIR	Fast Healthcare Interoperability Resources
GGP	Golden Generation Program
GSD	Genomics and Science Dojo
GSW	Genomics and Science Workshop
HHFA	Harmonized Health Facility Assessment
HHH	Head, Hand, and Heart (Score System)
HPHT	Hari Pertama Haid Terakhir
IBI	Ikatan Bidan Indonesia
ID	Identification
IDI	Ikatan Dokter Indonesia
ILP	Integrated Primary Services
IMERI	Indonesian Medical Education and Research Institute
IPRD	Integrated Public Health Research & Development
ISO	International Organization for Standardization
IT	Information Technology
KG	Knowledge Gateway
KFA	Kamus Farmasi dan Alkes
KIA	Kesehatan Ibu dan Anak
KONEKSI	Knowledge Partnership Platform Australia - Indonesia
MCH	Maternal and Child Health
MMS	Multiple Micronutrient Supplementation
MoH	Ministry of Health
MPP	Maternal and Perinatal Program
NTB	Nusa Tenggara Barat
ONA	A social enterprise, Co-founder OpenSRP
OpenSRP	Open Smart Register Platform
OTN	Oxford Tropical Network
PAUD	Pendidikan Anak Usia Dini
PHC	Primary Health Care
PNS	Pegawai Negeri Sipil
PNC	Postnatal Care
POLINDES	Pondok Bersalin Desa
POSKESDA	Pos Kesehatan Desa
POSYANDU	Pos Pelayanan Terpadu
PPPK	Pegawai Pemerintah dengan Perjanjian Kerja
PUSKESMAS	Pusat Kesehatan Masyarakat
RCT	Randomized Controlled Trial
RDT	Rapid Diagnostic Test
SID	Summit Institute for Development
SIHEPI	Sistem Informasi Hepatitis Indonesia
SMART	Standards-based, Machine-readable, Adaptive, Requirements-driven, and Technology-agnostic
SNOMED-CT	Systematized Nomenclature of Medicine - Clinical Terms
T&D	Training and Development
WA API	WhatsApp Application Programming Interface
WHO	World Health Organization

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ABOUT US

SUMMIT INSTITUTE FOR DEVELOPMENT

We strive for continuous improvement in health and human development through evidence-based health interventions

Culture

- **Motivation**

We fosters a culture of motivation, encouraging employees to set and achieve ambitious goals. Team members are empowered to pursue their passions and are recognized for their contributions, creating a dynamic and energized work environment.

- **Honesty**

Transparency and honesty are core values within the company culture. Open communication is promoted, and employees are encouraged to express their thoughts and ideas freely. This commitment to honesty builds trust and integrity at all levels of the organization.

- **Intelligent**

We values intellectual curiosity and a commitment to continuous learning. Employees are encouraged to think critically, solve problems creatively, and stay informed about industry trends. This culture of intelligence promotes innovation and adaptability in the ever-evolving business landscape.

- **Compassion**

A strong emphasis is placed on compassion and empathy in the workplace. Team members are supportive of one another, recognizing the importance of work-life balance and the well-being of each individual. This compassionate culture contributes to a positive and inclusive work environment.

Vision

Improvement through health research and human development at the community level through participatory evidence-based decision making and sustainable action.

Mission

To transform primary health care through:

- Improved participation of every member of the community in decision making, in forms of information, idea, suggestion or opinions.
- Improved access to information and health services.
- To establish a communication and information system at the community level to obtain evidence needed for decision-making processes.
- To continuously develop human resources as agents of change for improving health of the community.

Core Value

- Data driven decision making
- Human resource development
- Sustainability and collaboration
- Community participation
- Local impact, global relevance

PRINCIPLE OF ACTION

- Create **knowledge and innovations of substantive value via rigorous science**
- Implement knowledge with **action and proven impact locally**
- Enable fast-cycle learning **for sustained local impact at scale**
- Innovate for **local impact and national and global relevance**
- **Democratize knowledge, innovation, and science:**
  1. Communities are both **partners and beneficiaries**
  2. Led by **any-and-all persons** with motivation and ability, **no advanced degree required**, no specific background needed
  3. Enhance capabilities of staff and partners in **fundamental and advanced concepts.**
- Create future **transformational leaders who catalyze "smart" change**
- **Sustainably self-operated and locally owned**.

GOVERNING BOARDS

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Susy K. Sebayang, SP., M.Sc., PhD
(Chair)
Public Health Lecturer at Universitas Airlangga (2015 - present); Researcher at Indonesian Tobacco Research Alliance (2013 - present)

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(Board Member)
Ophthalmologist consultan, Kirana RSCM-FKUI (1998 - present), Dean of the Faculty of Medicine, University of Indonesia (2008 - 2012)

dr. Nurhandini Eka Dewi, Sp.A, MPH
(Board Member)
Chairman of the Council for Professional Service Development (MPPK) of the Indonesian Medical Association (IDI) West Nusa Tenggara Region (2017-2021 & 2021 - 2024)

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(Board Member)
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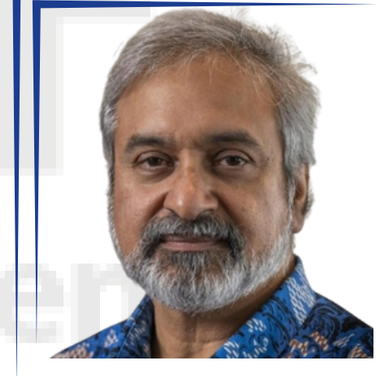
Dr. Ir. H. Rosiady H. Sayuti, M.Sc
(Board Member)
Head of Associate Professor in Department of Sosiology at University of Mataram (2020 - present), Former Provincial Secretary of NTB (2016 - 2019)



Dr. Anuraj H. Shankar , D.Sc.
(Board Member)
Senior Lead Investigator Community Health at Oxford University Clinical Research Unit (OUCRU) Indonesia

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Rr Muryanti Reksonegoro

Treasurer & Chief Finance Officer

Martinus Pradipto S.Kom, CODP.

Secretary & Director Human Resources

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(Chair of Supervisory Board)
Chairman of Perhimpunan Kedokteran Wisata Kesehatan Indonesia (Perkedwi) (2023-2025)

Josephine Kurniarukmi Dinarkinanti, M.Dev

(Supervisory Board Member)
Division Head of HRDGA for Kalbe Nutritionals

Caecilia Hartosarwilujeng

(Supervisory Board Member)
Terre des Hommes Netherlands - Asia (2014 - 2016 & 2019)

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Drs. dr. Roy Tjiong Tat Tjioe
Josephine Kurniarukmi Dinarkinanti, M.Dev
Mandri D. Apriatni, BEd, MDM
dr. Soewahjoe Dwi Antariksa Soesbandoro, Sp.OG (K)
dr. Reni Bunjamin, MPH
Ir. Iswidhani, MQIH
Dini Kartikawati Prihatini, , MSi
Sudirman, SPt, M.Pd
Dr. Anuraj H. Shankar, D.Sc.
Marcella Pierce, MPH

SUMMIT STUDY GROUP

Drs. HM. Husni Muadz, MA., Ph.D
Drs. Dr. Roy Tjiong Tat Tjioe
dr. Aditiawarman, MPH
Mandri D. Apriatni, BEd, MDM
dr. William Jayadi Iskandar, Sp. A, CIMI, IBCLC, AIFO-K
Sudirman, SPt, M.Pd
Nisaa Rahma Wulan, MPH
dr. Siti Farida Santyowibowo, SpM(K)
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Prof. dr. Rita Sita Sitorus, PhD, SpM(K)
Dr. Anuraj H Shankar, D.Sc.
Dr. Emily R. Smith, ScD, MPH
Dr. Elizabeth L. Prado, Ph.D
Dr. Michael T. Ullman, Ph.D
Dr. Katie J. Alcock, PhD

WALL OF FAME

Susy K. Sebayang, SP., M.Sc., PhD
Sep 2007 - Sep 2012

Mandri D. Apriatni, BEd, MDM
Sep 2012 - May 2017

dr. Astri Ferdiana
Nov 2017 - Apr 2018

Inraini Fitria Syah, SKM, MPH
Apr 2018 - Jun 2020

Annisa Dwi Utami, ST., M.Gizi
Jun 2020 - Jan 2021

Prof. Dr. dr. Ratna Sitompul, Sp.M(K)
Jan 2021 - Dec 2023

Yuni Dwi Setiyawati, B.Nutr, MHID, Dietitian
Dec 2023 - present

LETTER FROM GOVERNING CHAIR

Indonesia's health sector continues to face significant challenges, particularly in rural and remote areas where access to quality healthcare remains limited. Issues such as maternal and child health, the rising burden of lifestyle-related diseases, and improving health infrastructure are key concerns. As an organization committed to improving public health, Summit Institute for Development (SID) recognizes the importance of addressing these challenges through local, sustainable solutions.

The progress we've made this year would not have been possible without the invaluable support of our donors, partners, and dedicated teams. Through these strong collaborations, SID able to deliver impactful programs and create meaningful change in the communities we serve. We would like to extend our heartfelt thanks to the Head of District Health Office in NTB, Garut, Badung, Pidie, and Sumbawa Barat for your ongoing cooperation and partnership. Your collaboration has been crucial in helping us reach and support those who need it most.

A sincere thank you also goes to our generous donors, including Bill and Melinda Gates Foundation (now Gates Foundation), Grand Challenges Canada, The British Embassy (Jakarta), DFAT trough KONEKSI program, and many more. Your trust and support have made it possible for us to advance our mission and make a lasting difference. We are deeply grateful for your continued commitment to our cause.

Our team's passion and hard work remain at the heart of everything we do. All of dedication ensures that each project we did is executed with care, expertise, and a lasting impact on the communities we serve. We also would like to extend our apology to the donors, partners or other stakeholders if in our delivery process you found wrongdoing that needs to be improved. As we move forward, we remain focused on building on our successes and continuing to work together to create sustainable and positive change. We are welcoming you to be part of our journey ahead and thank you to everyone who has been part of this journey, we look forward to achieving even more together.

Susy K. Sebayang, SP., M.Sc., PhD

LETTER FROM OUR CEO

As we reflect on the challenges faced by Indonesia's healthcare system, it is clear that significant work remains. While progress has been made, issues such as high maternal and infant mortality, limited access to healthcare, and disparities in health outcomes continue to impact communities, particularly in rural and underserved regions. These persistent challenges highlight the need for continued innovation, collaboration, and investment in health services to ensure equitable healthcare for all.

In response to these challenges, Summit Institute for Development (SID) has focused on strengthening healthcare through digital transformation. Our focus has been on addressing critical challenges related to improving data use for actions, and ensuring the strategic value of creating digitally enabled districts and observing its full transformation. This year, SID has made significant strides in promoting the use of FHIR-compliant applications and empowering local health officers with the knowledge and tools needed for successful digital health adoption. We introduced the FHIR curriculum tailored for non-developers and worked alongside government agencies and local institutions to enhance interoperability ecosystems, particularly in primary healthcare settings. A key milestone in this journey has been the development of team-based care on FHIR, a model that is transforming how primary healthcare services are delivered.

Building on this foundation, SID has also played a critical role in shaping global digital health solutions. As a co-founder of OpenSRP, a digital health platform now used in 17 countries, we have contributed to improving maternal and child health outcomes worldwide. Additionally, our innovation supported by global partners, OptiBP, has revolutionized maternal and child health monitoring by making blood pressure assessments more accessible and effective. Beyond technology, SID has advanced digital health adoption through strategic workshops, capacity-building, and the implementation of dynamic worker support systems that optimize frontline healthcare delivery.

Our efforts have not gone unnoticed. SID was honored to be named one of the Top 10 innovations in Primary Health Care by the World Health Organization (WHO), making us the only organization from Indonesia to receive this distinction. Furthermore, our role as a core partner of the Ministry of Health in the Primary Healthcare Consortium underscores our commitment to accelerating digitalization and fostering data-driven decision-making. One of our proudest achievements is the development of Knowledge Gateway (KG), a digital platform that assesses and supports thousands of frontline health workers across Indonesia, equipping them with the knowledge and resources needed to enhance service delivery.

SID's impact continues to expand. Our work currently covers eight districts: Lombok Barat, Lombok Timur, Lombok Tengah, Garut, Pidie, Badung, and Sumbawa Barat. We are on track to expand our reach to 10 districts, ultimately serving a population of 10 million. Additionally, SID has made significant contributions to scientific research, particularly through our laboratory work. We conducted the first genome sequencing in NTB and were the first from Lombok to publish whole genome sequencing data in a global repository. These knowledge products further reinforce our commitment to advancing health science and innovation.

Sustaining this progress requires strong partnerships, and SID remains dedicated to fostering collaboration with local governments, academic institutions, and global partners. By ensuring the longevity of our initiatives, we aim to create lasting impact and further advance Indonesia's healthcare system. Looking ahead, SID remains committed to driving digital transformation, fostering innovation, and ensuring the long-term success of the NextGEN project.

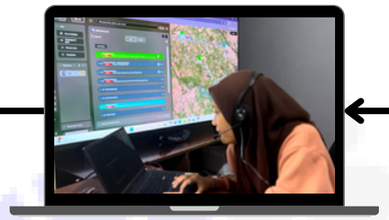
As a woman-led organization, SID is not only shaping the future of digital healthcare but also championing inclusivity and community empowerment. The coming years hold great promise, and we are more determined than ever to ensure that our work catalyzes lasting positive change. We are excited to share these developments and achievements as we continue our journey toward a healthier and more connected world.

Yuni Dwi Setiyawati, B.Nutr., MHID, Dietitian

WHAT WE DO

Establish District Level Ecosystem to Increase Data Use for Action

Enhance Data Usability for Decision Making and Action



Dynamic Worker Support

Automatic scheduling and improve efficiency in field work

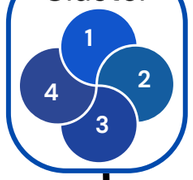
Data Utilization for Decision Making

Field Activity

Community Health Promoters are scheduled for field visits to assist with outdoor health service activities

Health Communication Center

Cluster



Public Health Data Center

Data centralization and input into the system connected with FHIR

Follow-up via: Call Center
WA API

Local Area Monitoring Dashboard

Scheduling for the next visit

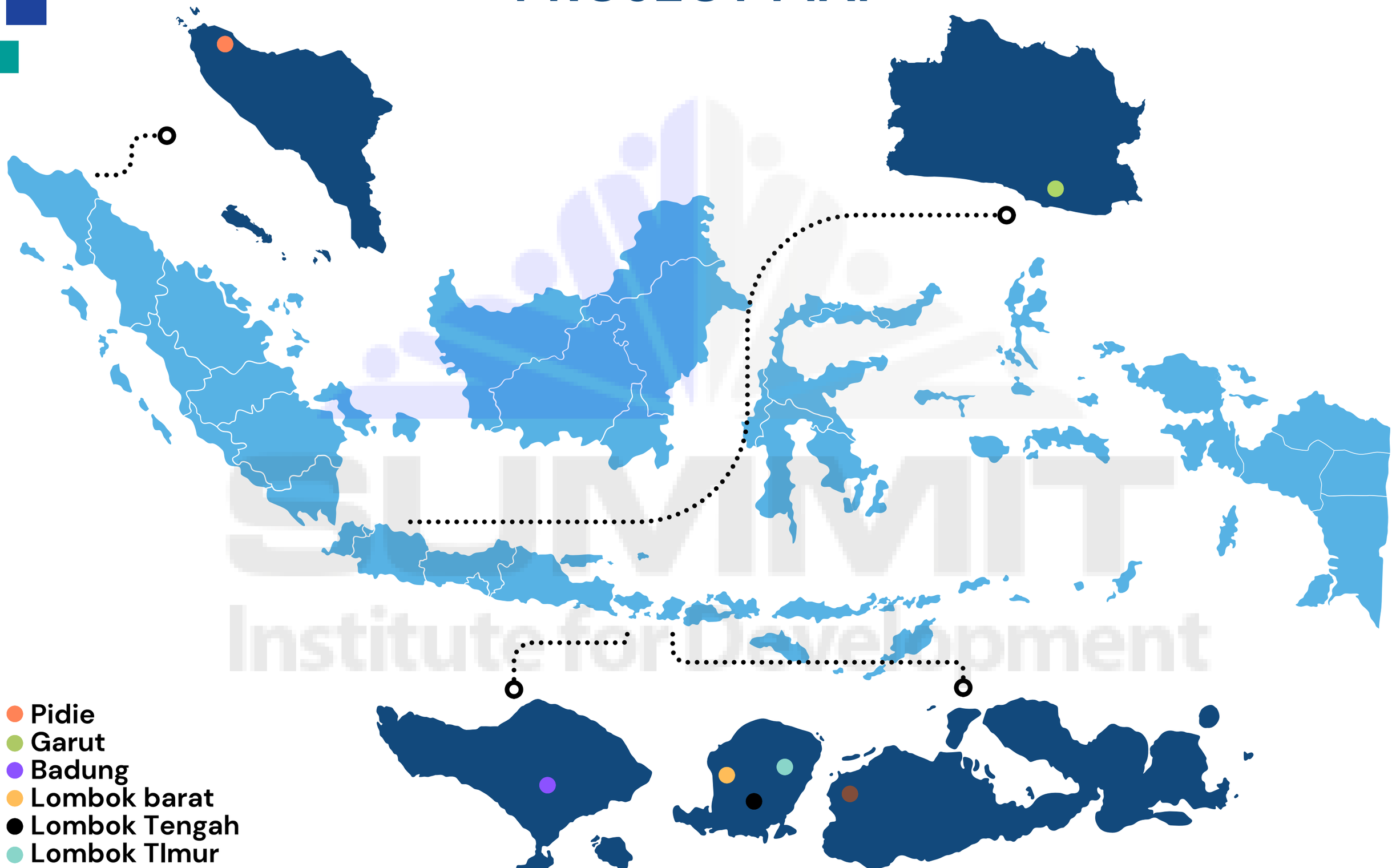
THE CHALLENGE

Real-time, accessible, and reliable health information is essential for action

There is a lack use of data standard and therefore poor interoperability for data system

Many primary health care facilities have not adequately utilized their data for action

PROJECT MAP



- Pidie
- Garut
- Badung
- Lombok barat
- Lombok Tengah
- Lombok TImur
- Sumbawa Barat

SID HISTORICAL PROJECT

2000

The SUMMIT Program

The SUMMIT Program (2000-2004) in Lombok, NTB, was a large-scale RCT improving pregnant women's micronutrient status. Funded by various organizations, it involved nearly 42,000 women

2012

The SUMMIT 10 Year

The SUMMIT 10 Year study examined the long-term impact of maternal MMN supplementation on children's development at ages 9-12, following 3,115 children from the original SUMMIT program in Lombok.

2014

The EMAS Program

The EMAS Program (2011-2016) improved emergency obstetric care and referrals in 150 hospitals and 300 health centers across six high-risk provinces. It helped reduce maternal and neonatal mortality by 25%, especially from preventable causes.

2014

Golden Generation Program

SID's research on child growth vulnerability led to the GGP program, which strengthens ECD centers, trains health officers, and uses real-time data. It reached 520,000 people through a trial in 80 service areas.

2014

THRIVE/OpenSRP

Launched in 2014 through the THRIVE project, OpenSRP improves maternal and newborn health by replacing paper records with an mHealth platform. Implemented in five districts, it supports 200+ users and has benefited over 120,000 women and children.

2016

WHO ANC App Testing

The WHO ANC app enhances antenatal care, aligning with WHO's 2016 guidelines. Midwives found it effective despite technical issues and supported its adoption with local adjustments.

2018

The Karma Project (TKP)

TKP explores how the flow of beliefs, emotions, actions, and thoughts (BEATs) forms a collective brain that shapes community resilience. Using AI tools and social data, the study about how communities adapt to stress in São Paulo and Jakarta. Strengthening this collective brain may help address deep-rooted issues like inequality and chronic disease.

2019

THRIVE GEN

The "THRIVE-GEN Intervention (2019-2022)" aims to improve maternal, newborn, child health, and early childhood development through strengthened healthcare systems, community support, and a multisectoral approach.

2019

RDT Malaria

SID, in collaboration with ONA, launched the RDT Malaria project in Manokwari in November 2019. Supported by local health offices, 15-20 health workers monitored infections across community, clinical, and surveillance sites.

2020

Validation Study OptiBP

The OptiBP Validation Study assessed the app's effectiveness for blood pressure monitoring in pregnancy, integrating with BUNDA for ANC recording and client tracking, while training health workers to improve hypertension detection and follow-up.

2021

CovPreg and CovNeo

The CovPreg (2021) and CovNeo (2021-2022) studies in East Lombok found that 35% of 956 pregnant women had COVID-19, increasing health risks, while monitoring 1,000 mother-baby pairs provided insights into maternal health, vaccination, and infant growth.

2022

Pregvax

PregVax (2022-2023), a longitudinal study with 9,000 pregnant women, evaluates COVID-19 vaccine safety, immunity, and vertical transfer, providing continuous monitoring and enhanced antenatal care to reduce risks.

2022

NextGEN - Team Based Care

NextGen (2022-2024) evaluates team-based digital healthcare in MCH services, including Lombok and Garut, measuring its impact on neonatal mortality and hepatitis B while training health workers and improving service delivery.

2022

Self Monitoring Blood Pressure (SMBP)

This study in Lombok, Indonesia (2022-2023), involved 68 participants in 8 FGDs and 26 interviews. Health workers saw Self-Monitoring of Blood Pressure (SMBP) as useful for early hypertension detection but had concerns about accuracy and follow-up.

2023

Digitally Enabled District (DED)

SID enhances primary health services through digital ecosystems (2023-2024), FHIR-based integration, and community health training, with evaluations in four pilot districts supporting Indonesia's health care transformation.

2024

DOJO 1.0

SID and partners enhance genomics research in Indonesia through Genomics and Science Dojo (GSD) sessions, a Genomics and Science Workshop (GSW), and a Dissemination Talk Show, involving 60 researchers and producing 35 manuscripts to support policy advocacy and scientific advancement. A distinctive feature of these activities is the inclusion of Sparing and the Shinjitsu Tournament, where participants are challenged to strike with arguments and defend their ideas, fostering a dynamic and critical scientific discourse.

2024

KONEKSI - AI in Healthcare

SID advances digital primary health services with AI (2024-2026) and FHIR integration, strengthening Indonesia-Australia research ties and optimizing care for 10 million people by 2027 across four districts.

2025

DOJO 2.0

Genomics and Science Dojo 2.0, led by SID in collaboration with OUCRU-ID, IMERI, and GSI Lab with support from the British Embassy, strengthens genomics research through sparring and tournament sessions (where participants challenge each other with arguments and defend their ideas), a five-day workshop, and mentoring aimed at producing scientific publications, policy briefs, and conference presentations.

2025

Multiple Micronutrient Supplemetation

The MMS project (2025-2027) improves maternal health by monitoring supplementation adherence and comparing digital vs. standard care for 10,000 pregnant women. Insights from this study will enhance nutrition strategies and support evidence-based policymaking.

2025

AAP Genomics

A multi-site study that uses whole genome sequencing to investigate genetic variations and resistance mechanisms in Klebsiella pneumoniae, Mycobacterium tuberculosis, and dengue virus, aiming to inform public health strategies for controlling drug resistance and improving outbreak response in Indonesia.

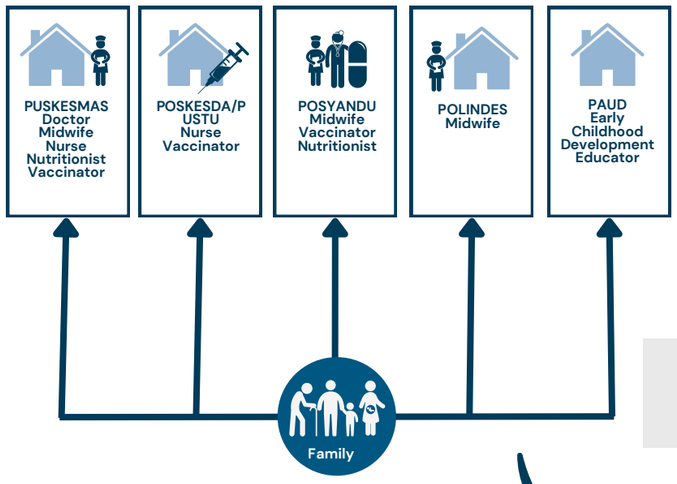
NextGen: Team-Based Care Services through an Interoperable Digital System for Improving the Quality of Maternal and Child Health Services

SID, as a core partner of the Ministry of Health, is working to enhance digitalization and data-driven action through the PHC Consortium platform. Real-time, accessible, and reliable health information is essential for effective action, yet many primary healthcare facilities have not fully utilized their data, largely due to a lack of standardized data and poor interoperability. To address this issue, we are implementing team-based care innovations to prevent care gaps and improve data utilization for better healthcare outcomes.

Framework

Current Status of Community Health Services (Provider-Centered)

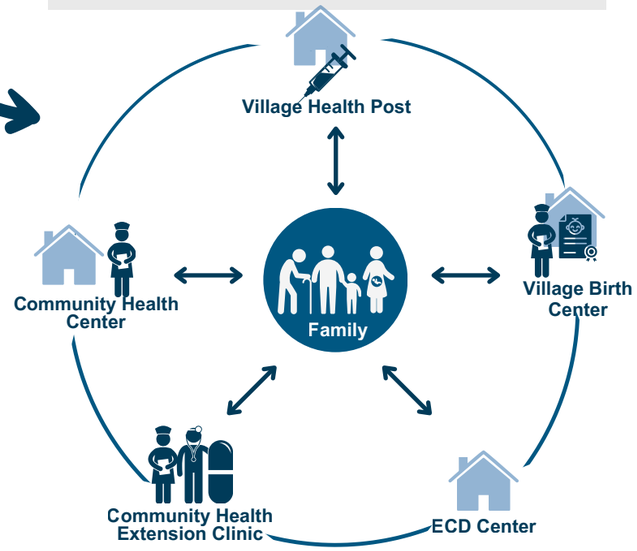
The community must seek multiple health service providers who are not connected in the same care plan



From scattered providers to seamless care—community health, reimagined

Team-based Community Health Services (Person-Centered)

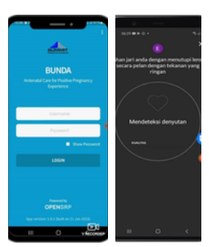
The community receives services from an integrated health service team

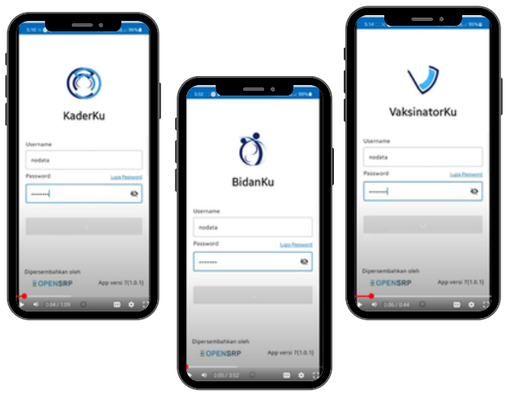


Data Integration and Digital Health Solutions

SID is tackling healthcare challenges in low-resource settings with **OptiBP**, an Android-based, non-invasive blood pressure monitoring tool tailored for Indonesia. **"Innovation makes care more accessible,"** and OptiBP, validated in Switzerland under ISO 81.060-2:2018, ensures accuracy by capturing pulse waves through a phone camera. This technology supports pregnant women and other health beneficiaries.

To complement this, the **Bunda app** enhances antenatal care by integrating smartphone-based blood pressure assessments, prioritizing maternity care quality over mere reporting.





Building on these innovations, SID launched **OpenSRP 2.0**, featuring:

- **BidanKu** for midwives to manage ANC/PNC visits and detect pregnancy risks.
- **KaderKu** for health volunteers to track Posyandu activities and key health metrics.
- **VaksinatorKu** for streamlined immunization with integrated family-based records.

With data from over 40,000 beneficiaries integrated into FHIR servers, SID bridges care gaps through **NextGen tools**, including WhatsApp reminders, call centers, and home visits. Regular engagements with community health officials ensure data-driven improvements in healthcare delivery.

"Stronger digital tools mean stronger health systems for all."

NextGen: Team-Based Care Services through an Interoperable Digital System for Improving the Quality of Maternal and Child Health Services

Community Health Promoter (CHPs) Home Visits and Posyandu Participation to Support Maternal and Child Health

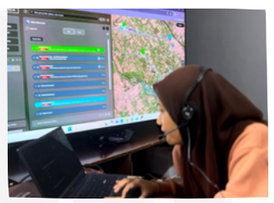
Community Health Promoters (CHPs) at SID **"bring healthcare closer to homes"** by conducting visits to provide essential health education, communication, and physical examinations for pregnant women, mothers, and children. Their role ensures that antenatal care, childhood vaccinations, and other critical health services are properly attended to.

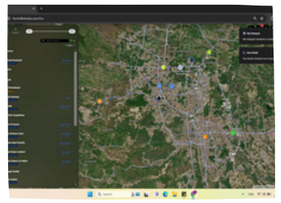
In addition to home visits, CHPs actively participate in Posyandu (community health posts) to monitor maternal and child health. They help ensure that pregnant women receive complete examinations and that toddlers receive timely care and vaccinations, strengthening community-based healthcare through direct engagement and trust-building.

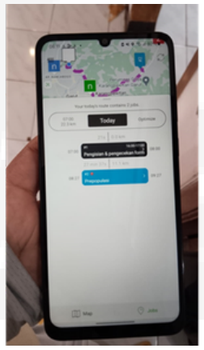
A community health promoter in Lombok plays a crucial role in supporting maternal and child health by conducting home visits to pregnant women and mothers with toddlers, providing essential health education, communication, and physical examinations to ensure their well-being. They also actively participate in Posyandu to monitor antenatal care attendance and ensure that pregnant women and toddlers receive complete health examinations, empowering families with knowledge and fostering healthier pregnancies and childhoods.

"Healthy mothers raise healthy generations"

Deployment of Dynamic Worker Support







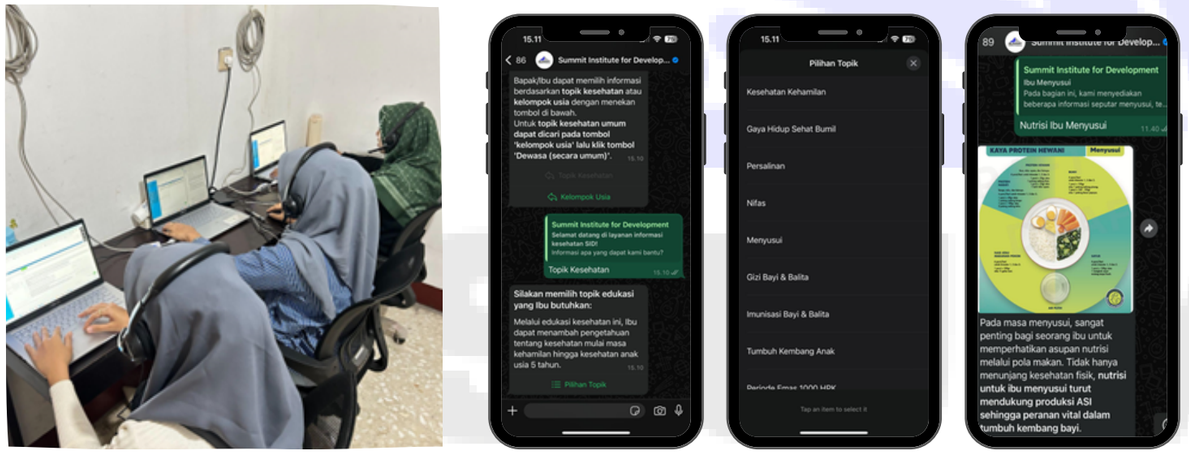
The system was designed to transition frontline worker scheduling, such as for Community Health Promoters (CHPs), from manual to automated. **"Efficiency in healthcare starts with smart coordination,"** and through a logic script process, data is collected, processed, and transformed into dynamic tasks that are monitored in real time. Key features include dynamic assignments, tracking, and route optimization. Operators play a crucial role in ensuring field team readiness, assisting during fieldwork, addressing issues, and providing feedback—enhancing the overall efficiency and impact of community healthcare services.

SID's Dynamic Worker Support (DWS) system has been deployed since July 2023, with a **total of 517 users** to date, including **midwives, vaccinators, community health volunteers (kader), and community health promoters (CHP)** involved in **home visits, health promotion, and Posyandu activities.** By utilizing the **HelloTrack app** for **task monitoring and management**, the system ensures **timely task completion, efficient resource allocation, and improved engagement with community health services**

NextGen: Team-Based Care Services through an Interoperable Digital System for Improving the Quality of Maternal and Child Health Services

Health Communication Center: Use of Advanced Chatbots and Communication Systems

The Health Communication Department at SID has implemented WhatsApp API campaigns to enhance beneficiary communication, ensuring "timely information leads to healthier decisions." These campaigns include introduction messages, antenatal care (ANC) reminders, post-pregnancy follow-ups, and notifications about care gaps to keep beneficiaries informed. Additionally, postnatal care (PNC) reminders, vaccination follow-ups, and routine health monitoring messages strengthen engagement. Weekly educational messages and home visit reminders from Community Health Promoters (CHPs) further support mothers



"A well-informed mother is an empowered mother," which is why messages also cover BPJS health insurance, maternal and child health outcomes for healthcare providers, and pregnancy supplementation (MMS) monitoring. Hepatitis B tracking ensures comprehensive maternal and child care.

To extend this impact, SID's call center facilitates direct communication, offering real-time assistance. Between January and December 2024, over 39,000 women received support through more than 195,000 calls and messages. **"Small reminders create lasting health impacts,"** with home visit sessions significantly raising awareness about maternal and child health.

Implementation of the Heart, Hand, and Head (HHH) Score

To enhance frontline health worker performance and motivation, SID introduced the Heart, Hand, and Head (HHH) score, a feedback system that ensures **"better care starts with better support."** Initially implemented weekly for NextGEN Community Health Promoters (CHPs), it significantly improved service quality and job satisfaction.

.Seeing its success, SID expanded the HHH score to midwives and cadres in West Lombok, East Lombok, and Garut, reinforcing the belief that **"motivated health workers create healthier communities."** Monthly feedback sessions provide real-time performance insights, allowing healthcare workers to refine their skills.

"Turn knowledge into action for lasting impact."

NextGen: Team-Based Care Services through an Interoperable Digital System for Improving the Quality of Maternal and Child Health Services

Capacity Building and Knowledge Assessments

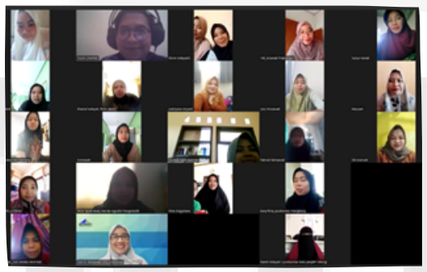
Socialization of Primary Service Integration (ILP) and Training on 25 Competencies for Community Health Volunteers

SID, a key partner of the Indonesian Ministry of Health in the **Primary Health Care (PHC) consortium**, is driving the **"future of healthcare through digital transformation."** By equipping districts with digital capabilities, SID accelerates the digitalization of **Integrated Primary Services (ILP)**, local area monitoring (PWS), and program impact assessments.

Over **2,300 frontline health workers**—including **cadres, midwives, and vaccinators**—have participated in ILP socialization and OpenSRP training, ensuring **"seamless data for better care."** As a **co-founder of OpenSRP**, **now used in 17 countries**, SID is committed to "**unifying preventive, curative, and rehabilitative services into one coordinated system,**" making healthcare more efficient and accessible.

"Future of healthcare through digital transformation.

Knowledge Gateway Assessment for Midwives



To **strengthen healthcare service delivery**, SID conducted **Knowledge Gateway (KG) assessments** for **1,809 midwives in Lombok** and **1,253 midwives from 67 Puskesmas in Garut** in September 2024. This **"innovative approach to measuring healthcare competencies"** evaluates midwives' knowledge of maternal and child health services.

KG is an **online, proctored assessment platform** designed for **frontline health workers**, including midwives, nutritionists, and community health volunteers (kader). Before 2021, **900 midwives across five districts** had participated in KG assessments, which were developed using **500 curated questions** reviewed by IBI, FHW supervisors, and the Ministry of Health.

Each 60-minute test consists of 100 randomized multiple-choice questions, ensuring "fair, balanced, and standardized evaluation." Key topics include midwifery care, ANC, labor and delivery, neonatal health, emergency care, family planning, and infection prevention.

Developed in collaboration with **BAPELKES of the Ministry of Health**, KG is **"the first of its kind in Indonesia"**—a crucial step in **data-driven capacity-building for midwives**. SID works with partners to **translate results into action** through targeted training and competency-strengthening initiatives.

"Empowering midwives with knowledge, we empower communities with better healthcare," ensuring improved **reproductive, maternal, neonatal, and child health services** nationwide.

NextGen: Team-Based Care Services through an Interoperable Digital System for Improving the Quality of Maternal and Child Health Services

Knowledge Gateway Assessments Report Dissemination

Evaluation, KG assessment result analysis and evaluation were conducted from October 3 to 7, 2024, by the SID team. The test results and recommendations were then disseminated and reported to the **District Health Office of Garut, East Lombok, West Lombok, and Central Lombok District**. Based on the results of the KG assessment, SID provided recommendations to address conditions that require improvement on midwifery competencies to increase the quality of maternal and child health services.

"Knowledge assessment is not just about scores; it's a roadmap for strengthening midwifery skills and reducing maternal and infant mortality."

In Garut, the assessment identified gaps in competencies, with most participants scoring below the 80% cut-off, and a median score of 66.67%. Higher scores were observed in midwifery care and emergency care, while lower scores appeared in professional ethics and reproductive health. Midwives with a bachelor's or professional degree performed better than those with diplomas.

The analysis showed no significant impact of workload on scores, but experience slightly improved knowledge. Civil servants (PNS) and PPPK employees had similar scores, while honorary workers scored lower. These findings highlight the need for continuous competency development to maintain high midwifery standards.

The KG assessment results provide a foundation for targeted interventions to enhance midwifery skills, ultimately improving maternal and child health services. Strengthening midwifery competencies is crucial in reducing Maternal and Infant Mortality Rates in Garut District.

The competency assessment of midwives in **Lombok** showed varying scores across regions. In **West Lombok**, reproductive health had the lowest scores, with 75% of midwives scoring between 0–60%. Neonatal Care, Professional Ethics, and Documentation & Reporting also had low scores, with significant variations in Professional Ethics.

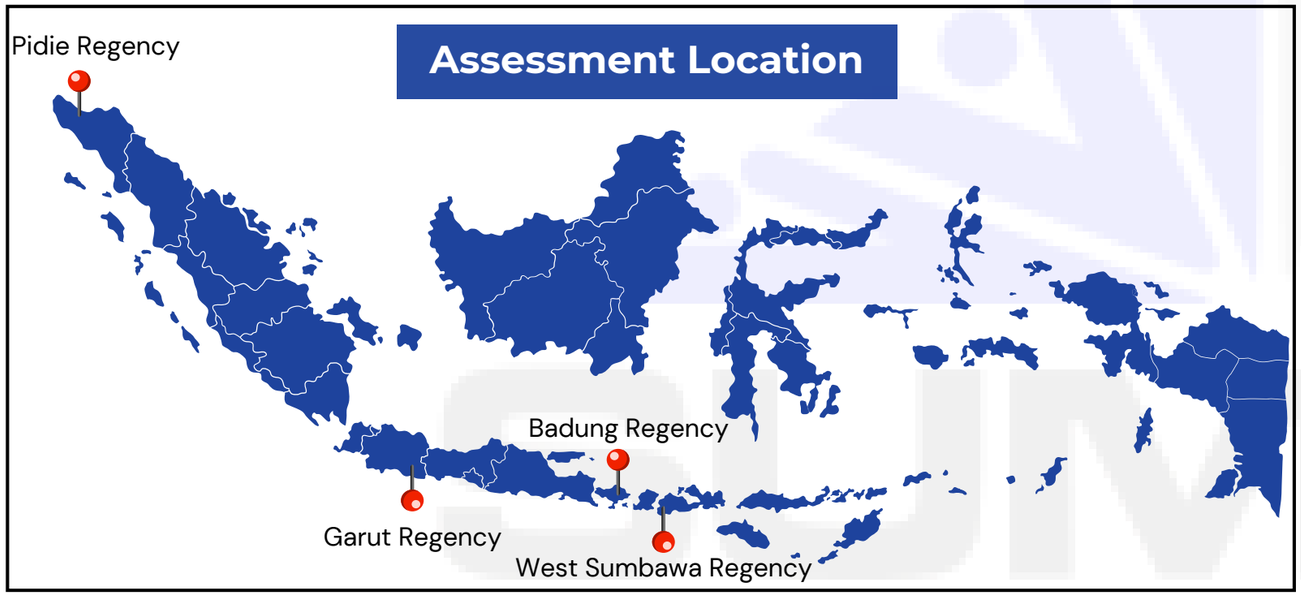
In **Central Lombok**, most categories had median scores between 60–70%, except for Professional Ethics, Reproductive Health, Neonatal Care, and Documentation & Reporting, which were below 60%. While some midwives had strong knowledge, others had limited understanding, highlighting the need for training. Midwifery Care, Family Planning, and Postnatal Care had higher scores (above 70%) but remained below the standard.

In **East Lombok**, KG scores ranged from 7% to 87%, with a median of 62%. Most participants scored between 50–75%, but an uneven distribution indicated that some midwives had significantly lower scores than the average.

DED (Digitally Enabled District)

SID is a core partner of MoH at National PHC Consortium, to advance digitalization in Indonesia. We conducted a survey to assess the service availability and digital readiness in all Puskesmas and Pustu in 4 districts: Pidie (Aceh), Garut (West Java), Badung (Bali), and Sumbawa Barat (West Nusa Tenggara).

Assessment Location



The objective of this project is to understand what constitutes good performance in primary healthcare services, to identify the factors influencing healthcare service performance, and to explore how these factors can be improved through digital readiness and the implementation of digital health tools.

Project Components:

1. Development of Digital Health Landscape Tools
2. Service Delivery Assessment and Digital Roadmap Development for Primary Healthcare Transformation
3. Implementation of Best Practices in Primary Healthcare Services to Create a Digital Health District Model

Project Timeline: August 2023 - January 2025

Assessment 1: Baseline assessment of service readiness & digitalization

Harmonized Health Facility Assessment (HHFA): Evaluated the availability, readiness, and quality of health services provided by Puskesmas (Puskesmass), focusing on service availability, facility readiness, quality of care, and management and finance. As a result, it highlights both the strengths and areas that need improvement in the delivery of healthcare services at the primary level.

Digital Readiness Assessment (DRA): Assessed the digital readiness of Puskesmas, measuring their preparedness for digital transformation. This includes evaluating the vision and strategy for digital health, the presence of a skilled workforce capable of utilizing digital tools, and the development of information systems that support effective service delivery. The DRA provides insight into how health facilities are positioned to adopt and integrate digital technologies.

Digitally Enabled Service Delivery (DESI): Evaluated the extent of digitalization in health service delivery, covering both Puskesmas and Pustu (smaller Puskesmas). It examines how digital tools and technologies are being used in daily operations, including the implementation of electronic health records, telemedicine, and other mobile health applications.

DED (Digitally Enabled District)

Digital Health Transformation Workshop: Survey Findings and Strategic Follow-Up Plan

By analyzing the data gathered, SID provides actionable insights into the current state of healthcare services in these districts and the extent to which digital tools can enhance service delivery. The results of these studies will serve as a robust foundation to guide the digital transformation of primary healthcare services, enhancing quality, accessibility, and efficiency across Indonesia.

Following up on the survey results, SID hold a three-day workshop titled "Digital Health Transformation Workshop: Survey Findings and Strategic Follow-Up Plan" to discuss and collaborate with the relevant government bodies and representatives from each Puskesmas and Pustu in Badung Districts and Garut District to create an evidence-based roadmap and strategic recommendations to catalyze digital transformation.

In details, the objectives of this workshop are as follows:

- Disseminate the results of the Digital Readiness survey
- Identify the challenges faced by primary health facilities in achieving optimal digitalization
- Design solutions and action plans based on the priority issues identified from the survey results

The workshop was also designed to include a session on common errors and pitfalls in healthcare. This was followed by two working group discussion sessions:

1. Working groups to identify and prioritize key challenges.
2. Working groups to develop detailed action plans for the identified challenges, which would later serve as the foundation for roadmap creation.

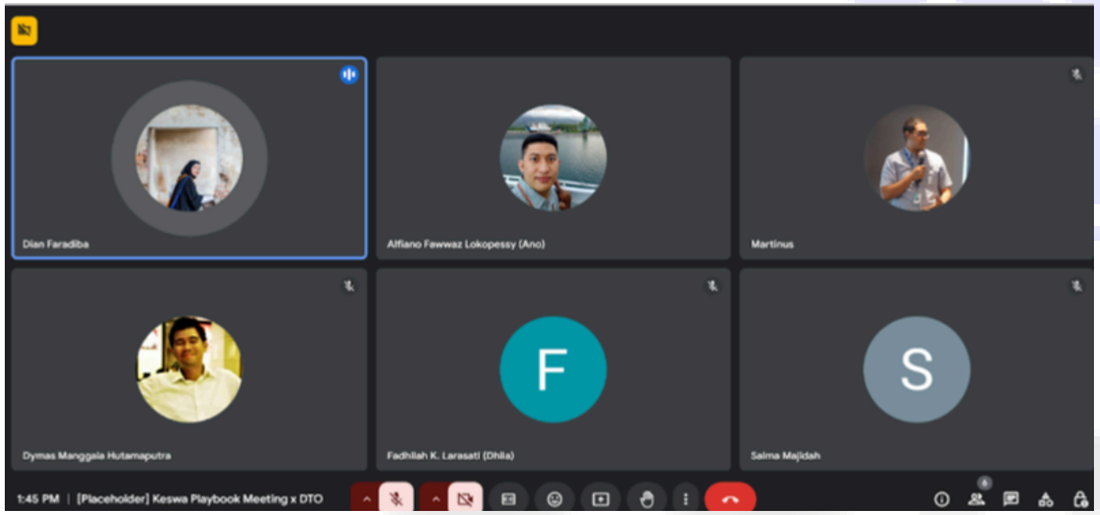
Four working groups were formed based on their digitalization performance, as assessed by the survey. Each group had its own facilitator and notetaker. During the working sessions, there was also a presentation from a Puskesmas sharing their best practices in implementing the ILP and digitalization.

DED (Digitally Enabled District)

Digitalization tools: operational & service delivery data in Puskesmas & Posyandu

Advancing Interoperable Healthcare: Contributions to Playbook Playbooks PTM and Keswa Development

Indonesia's healthcare system is advancing with the Satusehat Playbook, a framework for seamless health data exchange nationwide. Satusehat standardizes medical data using ICD-10, SNOMED-CT, LOINC, and Indonesia's Kamus Farmasi dan Alkes (KFA) for local compatibility. The integration follows six steps, ensuring smooth adoption with FHIR standards and comprehensive training.



DTO and SID Online Collaboration Meeting for Playbook Keswa

The Summit Institute for Development (SID) supports Satusehat's implementation, collaborating with DTO to develop technical resources. SID has launched Playbook Skrining PTM and is now working on Playbook Kesehatan Jiwa to enhance mental healthcare. Through these initiatives, Satusehat strengthens digital health integration and improves healthcare outcomes across Indonesia.

Real-time local monitoring dashboard, integrating operational & service delivery data

The developed dashboard is the ILP dashboard, which consists of six major categories: ILP Cluster 1 through ILP Cluster 4 and Cross Cluster Dashboard, along with the Posyandu Dashboard. The ILP Dashboard, especially in Cluster 2, will include both indoor and outdoor data. Meanwhile, the Posyandu Dashboard will focus specifically on outdoor data, particularly information related to Posyandu activities.

A data storage and streaming environment was also established to enable the dashboard to automatically update and reflect real-time data. The data obtained will be transformed into a standardized format using FHIR through FHIR mapping. Data from the database can be queried directly to the dashboard and displayed. In parallel, FHIR mapping that is not yet completed and data that has not yet been fully stored in BigQuery will be processed using Python scripts to prepare the data for display.

"Empowering healthcare with real-time insights—The ILP and Posyandu Dashboards seamlessly integrate indoor and outdoor data, leveraging FHIR mapping and automated streaming for a smarter, data-driven future."

DED (Digitally Enabled District)

Training and Assessment for Front Health Workers knowledge & skills

FHIR Training and assessment: Introduction to Interoperability and FHIR (Februari 2024)

This is a comprehensive initiative aimed at fostering healthcare interoperability within Indonesia. Fifty key stakeholders, including District Health and Communication officers from eight districts, were invited to participate.

This initiative signifies a significant stride towards advancing healthcare practices in Indonesia, underlining the commitment to knowledge dissemination and proficiency enhancement within the healthcare sector. The robust structure of the program and the commendable participant outcomes position this effort as a catalyst for positive transformation within the healthcare landscape.

> **Interoperability is the bridge to better healthcare, when data flows seamlessly, lives are saved effortlessly.**

The training covered data cleaning, analysis (descriptive, correlation, regression), and visualization using Tableau Public. Participants presented their findings and were assessed on tasks, exams, and engagement. Performance levels ranged from needs improvement to excellent, with two participants scoring 80–90, demonstrating top proficiency.

Data Analysis workshop

The Digital Readiness Assessment (DRA) in Kabupaten Garut highlighted that beyond infrastructure, human resource capacity is key to digital transformation. To strengthen data skills, SID organized a Data Analysis Training (Oct 8–10, 2024) for 35 participants from the District Health Office, Puskesmas, and local universities.

"Data is not just numbers; it's the key to informed decisions, better healthcare, and empowered communities."

DED (Digitally Enabled District)

Training and Assessment of Front Health Workers' knowledge & skills

Enhancing Data Interoperability and Action: FHIR Capacity Building Workshop

SID, in collaboration with the Garut District Health Office, organized the Enhancing Data Interoperability and Action workshop to build local expertise in digital health. The initiative supports Garut's independent management of its health data ecosystem through FHIR-based applications like KaderKu, BidanKu, and VaksinatorKu. Participants were selected via a pre-assessment on IT programming and server management to ensure readiness for the training.

The 4-day workshop covered FHIR, server management, and OpenSRP 2.0, integrating presentations with hands-on exercises. Daily assessments tested participants' understanding, leading to final knowledge and hands-on evaluations. Of the 14 participants, 3 achieved "excellent" ratings, with the top two from the Garut Institute of Technology and one from the District Health Office.

Following the training, participants received access to the SID trainee server for further exploration. Their progress will be reviewed in a follow-up discussion with the DHO Garut to determine the next steps for top-performing participants.

"Empowering local health systems through digital expertise is key to sustainable healthcare innovation. By mastering FHIR and OpenSRP, we enable independent, data-driven decision-making for a healthier future."

Digitalization training for Cadres

Digital Data Collection for Kunjungan Rumah and Posyandu Training (December 2024)

Posyandu and home visits are essential for providing primary health care, but the process of manually entering data from these activities is time-consuming. To improve efficiency and enable quicker data analysis, the use of digital forms is being promoted. The DED program is actively supporting this initiative by providing training and assistance to community health workers (kader). There were 73 cadres in 11 posyandu have been trained for using digital form kunjungan rumah and posyandu.

"Digital transformation in community health starts with those on the frontlines. By equipping kader with digital tools, we ensure faster, more accurate data collection for better healthcare services."

Testimonial from the Government Partners

"On behalf of the leadership (Head of the NTB Provincial Health Office), I would like to express my gratitude to SID for all the programs that have been implemented, especially those that are directly aligned with government programs, the provincial health office, district/city health offices, and community health centers. Of course, due to various limitations, we have not yet been able to fully implement all the details of these programs, particularly those related to direct follow-up with the community. Summit has its own scheme for program implementation in the field, which I believe is highly beneficial in supporting the success of existing programs, especially in maternal and child health."

The right side: H.Badarudin,S.Kep.Ns.MM Head of the Division for Disease Prevention and Control, NTB Provincial Health Office

Jamali, S.Kep., Ners.
(**Head of Puskesmas Lepak, East Lombok Regency**) shared his thoughts partnership with SID:

"*The collaboration with Summit has had a significant positive impact, especially in monitoring midwives' activities through Dynamic Worker Support using the Hello Track application. This system streamlines the data collection of pregnant women, supported by an operator in Lepak who continuously monitors the process. With this innovation, healthcare services have become more structured and efficient. We hope this collaboration continues to enhance service quality.*"

"I would like to express my gratitude to the SID team for their support in developing the dashboard and Communication Center system. This dashboard accelerates data analysis, action planning, and program evaluation, both at the Health Office and Community Health Centers (Puskesmas). The piloting in 9 Puskesmas serves as a reference before being implemented in 67 others. The Communication Center system has also greatly improved work efficiency and optimized data management for program evaluation. I hope this innovation continues to develop and bring even greater benefits."

Sri Prihatin - Sub-Coordinator for Family Health and Nutrition at the Garut District Health Office.

dr. Dinan Bagja Nugraha, MM.Kes
(**Head of Puskesmas Cibatu, Garut Regency**) shared her thoughts partnership with SID:

"*DED project is piloted in Garut in order to solve the existing problems about health information system. The information system of each Puskesmas services/programs are fragmented. There are about 38 reporting apps need to be filled by the health officers. Hopefully, with the DED project that developed by SID team, the health Information System can be simpler & easier to operate and FHIR server enable Puskesmas to analyse the data according to the needs*"

Genomics and Science Dojo and Workshop (DOJO 1.0)

Genomics plays a crucial role in health and development, yet Indonesia faces challenges in bioinformatics and data analysis due to limited expertise. To address this, SID, in collaboration with OUCRU-ID, IMERI, and GSI Lab, launched the Genomics and Science Dojo (GSD) and Genomics and Science Workshop (GSW) with support from the British Embassy.

The hallmark of the Genomics Science Dojo is the presence of sparring and the Shinjitsu Tournament, where participants are challenged to attack opposing teams with arguments and defend their ideas, creating dynamic and critical scientific discussions. The GSD, held bi-monthly, fosters critical thinking, data analysis, and scientific communication, while the GSW, a 5-day intensive workshop, helps participants refine their research and prepare high-impact manuscripts. The first phase involved 60 researchers, producing 35 scientific manuscripts. Participants went through several Dojo Sprints (January 16 – February 13, 2024), the Shinjitsu Tournament on February 27, 2024, and finally a workshop in Lombok from March 5-10, 2024.

To further strengthen Indonesia's research ecosystem, a Dissemination Talk Show will introduce the Dojo approach to key stakeholders, promote genomics research, and encourage policy-driven action. The event will bring together government representatives, researchers, and media to sustain and expand the impact of genomics in Indonesia.

Indonesian Researchers at the International Pandemic Sciences Conference 2024

Indonesian researchers from the Summit Institute for Development (SID) and the Oxford University Clinical Research Unit – Indonesia (OUCRU-ID) showcased groundbreaking findings on COVID-19 vaccine strategies at the International Pandemic Sciences Conference 2024 in Oxford, UK (July 1-2, 2024). Their studies focused on vaccine reactogenicity, pregnancy outcomes, and immune responses, contributing to global discussions on pandemic preparedness and maternal health.

Key research findings: Kusuma Herawati's study on vaccine safety in pregnant women found that inactivated vaccines (e.g., CoronaVac, Sinopharm) caused fewer side effects compared to mRNA or vector-based vaccines (e.g., Pfizer, Moderna, AstraZeneca). Miftahul Jannah analyzed COVID-19 vaccination and pregnancy outcomes in over 3,800 women in Lombok, emphasizing the need for targeted vaccine policies in low-resource settings. **Edward Sutanto's award-winning research on immune responses to different vaccine types highlighted the need for tailored vaccination strategies for pregnant women to ensure optimal protection.**

Their participation underscores Indonesia's commitment to strengthening pandemic response, improving maternal and child health, and enhancing global research collaboration. SID continues to play a vital role in translating research into action, ensuring equitable healthcare solutions for vulnerable communities.

BUILDING CAPACITY

SID's 3-Days Training Program for Recruitment and Skill Development

Our 3-Days Training Program is a key component of the recruitment process for various positions, including Community Health Promoter/Coordinator (CHP/C), Data Entry, Health Communication Officer, Project Admin Officer, and other similar roles. The primary objective of this program is to equip the candidate that will be the local healthcare workers with the essential skills and knowledge required to support SID's health initiatives, aligning with our mission to improve maternal and child health outcomes through evidence-based interventions.

Day 1

Participants are introduced to SID, Primary Healthcare Integration (ILP) and Maternal and Child Health (KIA), followed by a knowledge test to assess their understanding.

Day 2

Participant are given the materials about Informed Consent, the Health Communication Center, the NextGen and Digitally Enabled District (DED) Projects, accompanied by knowledge assessments and roleplay exercises.

Day 3

Focuses on evaluating participants' ability to apply their learning in real condition scenarios, with roleplay assessments. HR interviews were also conducted on the same day as part of the recruitment process.

The training was conducted over three days in locations where we have ongoing projects, such as Lombok and Garut. In 2024, we organized the training five times, engaging approximately 181 participants and successfully hiring 61 new staff members.

The first 3-Day Training was conducted in Garut (Batch 1) took place in Bayongbong, Garut, from April 29 to May 2, 2024. This training involved 44 participants and led to the hiring of 15 new staff members, including 10 CHPs, 3 CHPCs, and 2 Project Admin Officers. The second 3-Day Training in Garut (Batch 2) was conducted from August 22 to 26, 2024, with 40 participants. This batch resulted in the hiring of 22 new staff members, consisting of 15 CHPs, 3 CHPCs, 2 Health Communication Officers, and 2 Data Entry Officers. Following that, we held the first 3-Day Training in Lembar, Lombok on September 3 to 5, 2024, which involved 46 participants and led to the hiring of 8 CHPs. The next 3-Day Training was conducted in Garut (Batch 3) took place from September 5 to 10, 2024, with 51 participants. This batch resulted in the hiring of 13 CHPs and 3 Data Entry Officers.

> ***Building capacity, empowering communities, transforming healthcare.***

BUILDING CAPACITY

Those who meet the required passing score advance to next day. At the end of the program, those who successfully complete all stages of the training were hired. However, for certain positions, additional position-specific assessments or user interviews may be required. This three days training ensures that our new hires are thoroughly prepared to support SID's health initiatives and make a meaningful impact in the communities we serve.

Many candidates expressed enthusiasm for the training. They greatly appreciated the activities and materials provided, which addressed their need to understand more about SID and its programs, as well as maternal health. They were also very grateful for the new connections they made during the training.

Participants Testimonials

Regita Rosdiana
3 Days Training Batch 1 passed participant from Garut
Overall, it was very insightful, and the materials presented were comprehensive. However, on the second and third days, the content was too focused on specific job positions, such as CHP/C and Health Comm. Hopefully the next 3DT can be more inclusive for all positions.

Irma Rahayuna
3 Days Training Batch 3 passed participant from Garut
The 3 Days Training program was an invaluable experience. It provided me with a comprehensive understanding of the company culture and my role, leaving me feeling well-prepared and excited to contribute.

Implementation of the Heart, Hand, and Head (HHH) Score

To ensure the smooth running of the project, monitoring and evaluation are essential. SID conducts monitoring and evaluation using a holistic approach, applying the HHH (Head, Hand, and Heart) framework, which encompasses all key aspects of a transformative experience.

Head →	Cognitive domain, theoretical and practical knowledge needed by someone to do their job
Hand →	Psychomotor domain, the practical skills and quality someone deliver in doing their job
Heart →	Affective domain, what the clients think about someone's job (external party assessment)

SID uses HHH assessments for Community Health Promoters (CHPs) to comprehensively evaluate the knowledge, practical skills, quality, and motivation of CHPs in carrying out their duties in the field. This assessments uses to ensure that everyone perform their intended function in their job.

> ***"Head for knowledge, Hand for skills, Heart for impact, a holistic approach to meaningful change.***

BUILDING CAPACITY

Enhancing Knowledge by Conducting KONEKSI and Hepatitis B Refreshment

The KONEKSI and Hepatitis B refreshment was held on December 6, 2024, with 54 participants of CHP and CHPC. This refreshment aims to equip employees with knowledge about hepatitis, in line with a government program that uses the SIHEPI application to collect screening data for pregnant and postpartum women, supporting data-driven decision-making. SID has taken the initiative to assist this program by providing the necessary knowledge to CHP. The refreshment was conducted over one day in the form of a seminar and assessment (KG) related to hepatitis, with alternating sessions of material presentations from the project team and assessment.

Capacity Building and Knowledge Assessments

Capacity building is one of the organization focus to maintain staffs knowledge cognitively ("Head"), we regularly conduct a knowledge test every three months, known as the General Certification (GenCert). This test is designed to assess the work quality of our staff and refresh their knowledge. In 2024, we assessed both Community Health Promoters and Community Health Promoter Coordinators, who work directly with beneficiaries in the field. This certification is planned to be extended to all staff.

The certification was conducted on November 8th and 11th, 2024, with a total of 64 staff participants in Garut and 52 staff participants in Lombok. Before the certification, we asked staff to create questions based on chapters 6 and 7 of our SID manual. The Training and Development (T&D) and Project team then reviewed and selected the questions, creating a question bank of 150 questions, divided into three parts: general information about SID employee regulations, activities in the field, and the HHH framework. The GenCert consists of 150 questions, divided into three sessions, with each session lasting 30 minutes. The questions are randomly distributed to participants and categorized into three difficulty levels: easy, medium, and difficult.

The results from this GenCert are used to determine the Head Score. These results are provided to CHPs in the form of a report every three months, which includes an analysis of scores based on predetermined indicators, helping CHPs identify areas for improvement.

"The mind is the compass that guides impactful change"

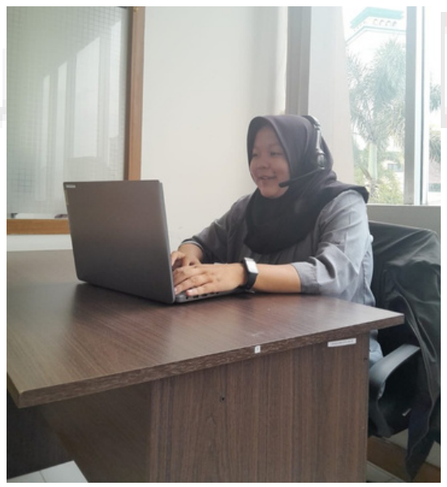
BUILDING CAPACITY

CHPs are also evaluated daily based on tasks assigned through the HelloTracks app by the Command Centre for the Hand Score. The Hand Score evaluation is conducted for five working days, from Thursday to Wednesday, using criteria such as percent success, percent attachment, percent check-ins, percent signatures, work hours, phone number collection, form submission timeliness, and form correctness.

> ***Real change starts when knowledge turns into action.***

Meanwhile, the Heart Score assessment is conducted by the Health Communication Center to gauge the emotional engagement and commitment of CHPs in maintaining and improving the quality of the program through daily performance. The Heart Score evaluation is carried out every day for five working days, from Thursday to Wednesday, using criteria such as introduction, attitude, appearance, health education, and overall satisfaction.

Every week, the Command Centre and Health Communication Center populate the results of the Head and Heart Scores for CHPs into a spreadsheet within the "Report Card" folder, which is updated monthly. The T&D team then provides feedback in the form of a 'report card' regarding CHP performance, accessible through the designated folder.



The T&D team will compile all the scores (Head, Hand, and Heart scores) and send the report to staff weekly, specifically on Fridays via email. The compiled results for all staff will also be sent to the supervisor, allowing both the supervisor and the staff member to monitor the work quality of the CHP. If the work quality decreases or is poor, a one-on-one session will be conducted to identify areas for improvement. If the same staff member receives poor results multiple times in a row, they will be enrolled in a training program.

We also plan to extend the HHH Score system to all departments. Currently, we are in the process of compiling and finalizing its implementation across the organization.

GenCert Participants Testimonials

Siti Ashmaraji Darmawan
General Certification participant from Garut
I am very grateful for the implementation of Gencert because it allows me to assess how well I understand the field manual (among other things). With the implementation of Gencert, I hope to continue improving my understanding of my duties as stated in the 'Manual Book,' whether in the field or not.

Zakaria Anshori
General Certification participant from Lombok
I was very excited about the Gencert. Although the results were not perfect, it serves as an evaluation for the future. The Gencert also acts as a benchmark to measure how well I have been working according to the manual book.

INSTITUTIONAL DEVELOPMENT AND ORGANIZATIONAL EFFECTIVENESS

Staff Skill Enhancement and Knowledge Development Programs

To improve the skills and knowledge of our staff, SID has implemented various programs, as mentioned in the previous section. One of these programs is a 3-day training session designed to filter and equip candidates with the necessary skills and knowledge before they begin working in real-world situations. Additionally, we have introduced the HHH framework as part of our performance management system. Staff members who repeatedly achieve poor results are provided with targeted training to help enhance their performance.

"Well equipped staff lead to well served communities"

Furthermore, we offer other training programs such as Hepatitis B Training and Refreshment Koneksi Training, which serve to refresh and further equip our staff with relevant knowledge. We also conduct regular refreshment sessions in Garut 1-2 times per week, focusing on health-related topics that are commonly raised by beneficiaries. This ensures that all staff members, even those without a health background, are well-prepared to respond effectively to beneficiaries' concerns.

Your paragraph text

Promoting Employee Well-Being through the Healthy Friday Programs

To support and enhance the physical well-being of our staff, we have introduced the Healthy Friday program, held 1-2 times a month on Fridays. The program begins with a series of stretching exercises, followed by light physical activities such as an aerobic warm-up. This leads into the main session, which features traditional games like boi-boian, benteng, gobak sodor, lompat tali, badminton, football, and dodgeball. The session concludes with a light aerobic cool-down to help relax the body.

"Healthy body, happy mind fostering teamwork through movement and play!"

The goal of this initiative is to foster teamwork and improve communication among employees. Additionally, we aim to provide staff with an opportunity to unwind and rejuvenate after a busy workweek, while also promoting greater awareness of the importance of maintaining overall health and well-being.

INSTITUTIONAL DEVELOPMENT AND ORGANIZATIONAL EFFECTIVENESS

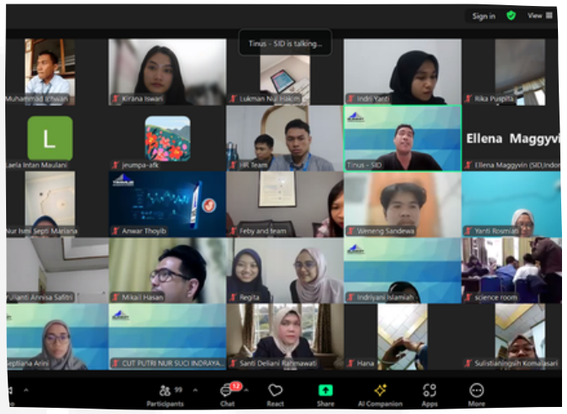
Engagement Event to Foster Unity and Collaboration

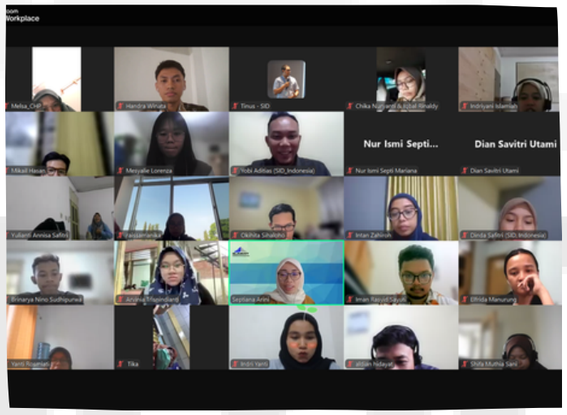
On August 17th, our company held a series of activities as part of the employee engagement events to celebrate and commemorate Indonesia's Independence Day. Various fun activities such as competitions and games were organized to foster a sense of togetherness among employees. Some of the activities included dodge-ball, guess the words, and notice games.

"Success isn't just about reaching goals, it's about enjoying the journey together"

In addition to honoring the struggle for independence, this event aimed to strengthen relationships among employees and create a more harmonious work environment. With the spirit of independence, all participants were enthusiastic and thoroughly enjoyed every moment of the activities.

Weekly Office Meeting: Enhancing Communication and Collaboration Across Departments



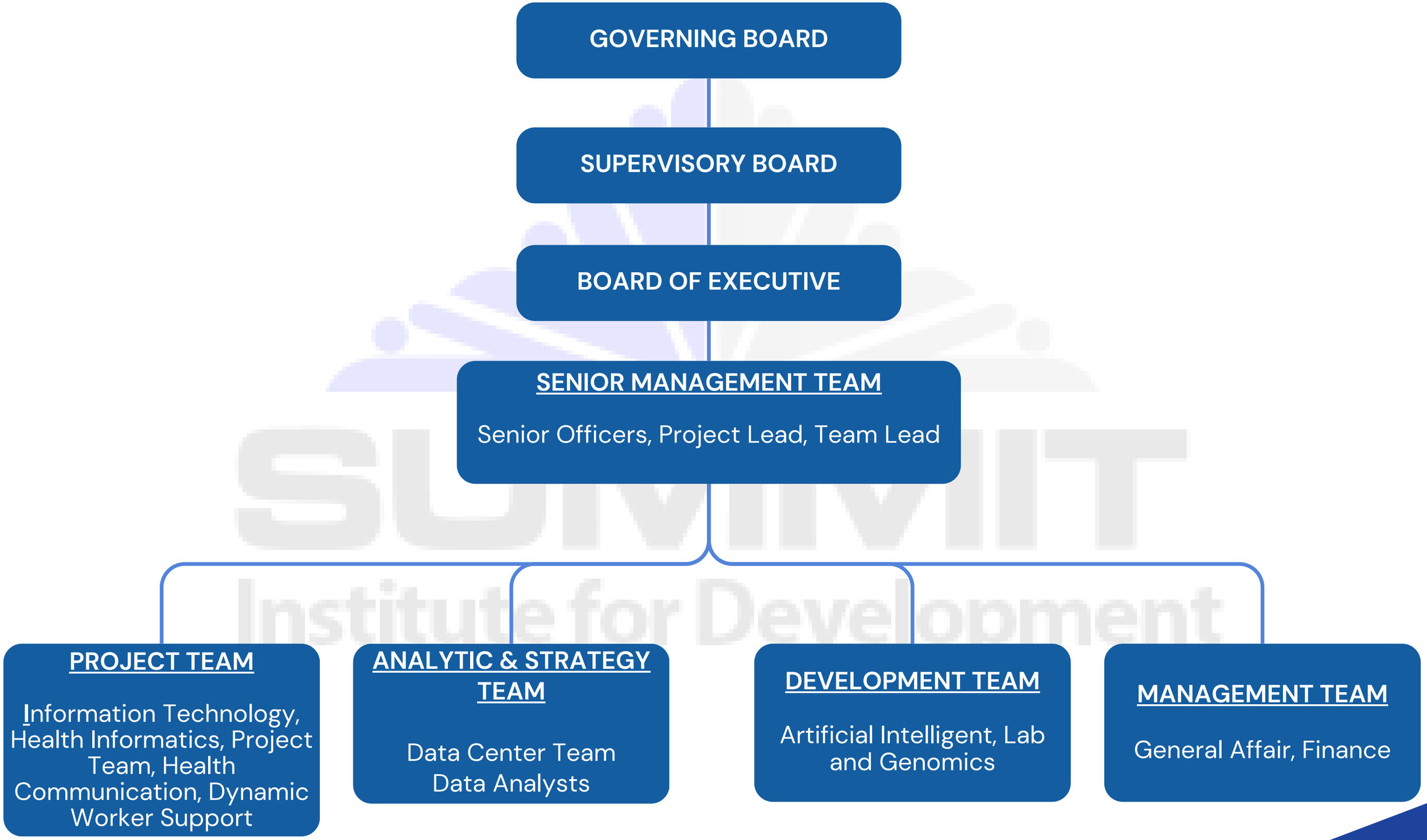


The weekly office meeting was routinely held online every friday, involving all staff members in Garut and Lombok. Led by the Training and Development team, the meeting covered departmental progress, as well as activities and events conducted during the week.

"A great meeting isn't about talking, it's about listening, collaborating, and moving forward together."

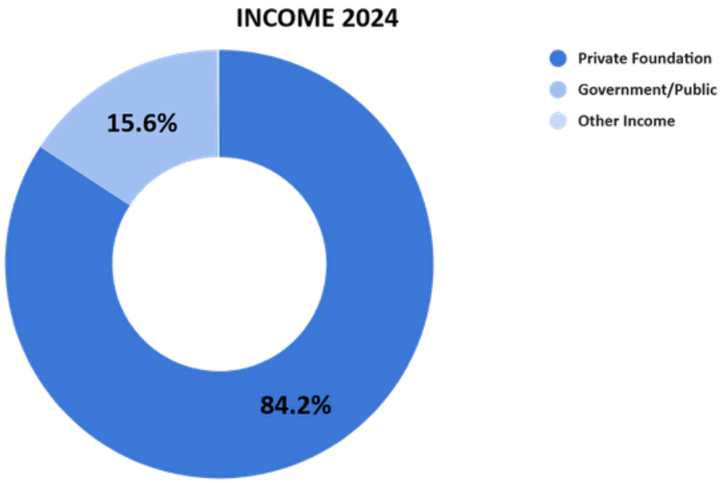
In addition to sharing work-related updates such as team progress and activities, this program also serves to enhance communication, foster collaboration, and ensure alignment across all departments. It includes appreciation segments, fun games, and concludes with a "pantun" (a traditional rhyming verse). Moreover, we provides a platform for employees to anonymously share work challenges and personal concerns through the "One Word for Today" segment.

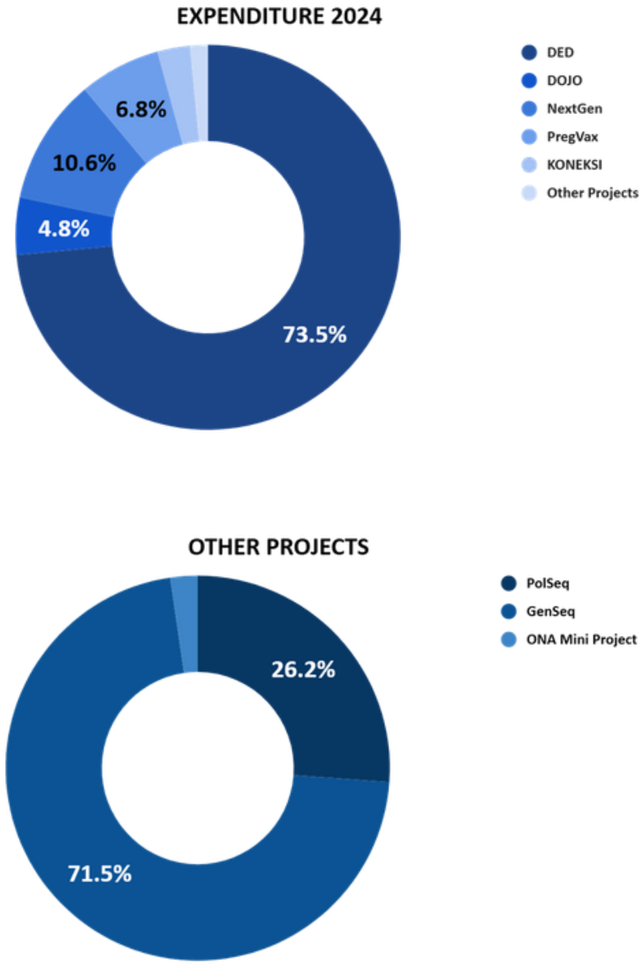
ORGANIZATION CHART



FINANCIAL SUMMARY

In this year, Summit Institute for Development (SID) derived the majority of its income from private foundation, totaling Rp 25,706,865,606.08 (84.2%). Additionally, government and public contributed Rp 4,752,170,337.13 (15.6%), making up a a substantial share of SID's funding. The remaining Rp 67,455,299.70 (0,2%) was classified as other income. SID has strategically diversified its funding sources over the years to minimize reliance on a single donor, ensuring financial stability and long-term sustainability. The financial report chart provides a clear visualization of income distribution, showcasing the organization's growth and funding structure throughout the year.



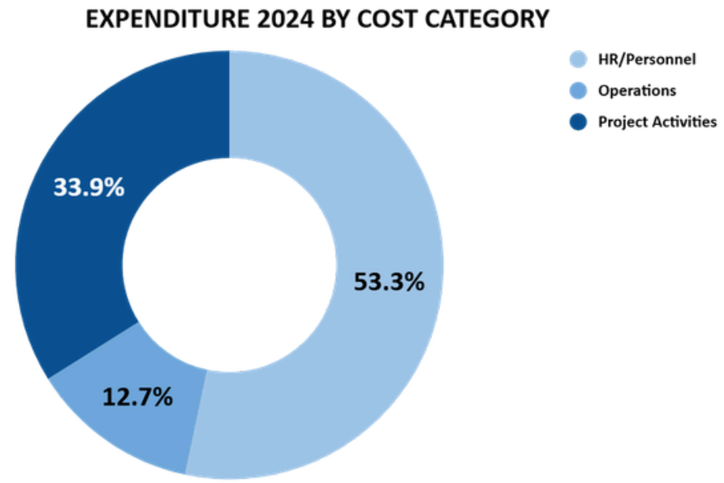


SID's programmes are grouped into seven programme areas, there are DED, DOJO, NextGen, PregVax, KONEKSI, PolSeq, GenSeq, and ONA Mini Project. DED program receiving the largest portion at Rp 28,480,242,737.90 (77.51%), reflecting its significant role in overall spending. NextGen follows with Rp 4,099,051,509.23 (11.17%), while PregVax and DOJO received Rp 2,648,754,988.75 (7.22%) and Rp 1,859,389,514.74 (5.06%), respectively.

Other programs, such as KONEKSI (Rp 1,052,323,987.34, 2.86%), GenSeq (Rp 424,786,236.90, 1.16%), and PolSeq (Rp 155,342,762.60, 0.42%), had more moderate allocations.

The SID Foundation and ONA Mini Project received smaller portions, with Rp 109,711,331.00 (0.0003%) and Rp 13,685,816.67 (0.00004%), respectively.

These figures illustrate the strategic prioritization of funding across various initiatives.



The expenditure by cost category highlights key areas of financial allocation. HR/Personnel accounts for the largest share at Rp 20,713,184,393.85 (50.37%), reflecting that our organization require significant investment in human resources to be able to drive the outcome and impact to the Pregnant women in our sites. Project Activities follow with Rp 13,177,691,663.82 (32.06%), indicating a strong focus on program implementation and development. Meanwhile, Operations received Rp 4,952,412,827.46 (12.05%), covering essential administrative and logistical costs. These figures emphasize the organization's commitment to workforce sustainability, efficient project execution, and operational support.

The financial statement has been audited by an external party.

PUBLISHED KNOWLEDGE PROJECTS SID

Original research

BMJ Global Health

Health workers' perspectives on self-monitoring of blood pressure by pregnant women: a qualitative study among community health workers, midwives, doctors and health system managers in Lombok, Indonesia

Tigest Tamrat ,[1,2] Yuni Dwi Setiyawati,[3] Raissa Manika Purwaningtias,[3] Nya Jeumpa Madani ,[3] María Barreix,[1] Antoine Geissbuhler,[4] Anuraj H Shankar,[5,6] Özge Tunçalp [1]

To cite: Tamrat T, Setiyawati YD, Purwaningtias RM, *et al*. Health workers' perspectives on self-monitoring of blood pressure by pregnant women: a qualitative study among community health workers, midwives, doctors and health system managers in Lombok, Indonesia. *BMJ Glob Health* 2025;**10**:e017532. doi:10.1136/bmjgh-2024-017532

Handling editor Naomi Clare Lee

► Additional supplemental material is published online only. To view, please visit the journal online (https://doi.org/10.1136/bmjgh-2024-017532).

AHS and ÖT are joint senior authors.

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For numbered affiliations see end of article.

Correspondence to
Tigest Tamrat; tamratt@who.int

ABSTRACT

Introduction Hypertensive disorders of pregnancy (HDPs) are a leading cause of maternal mortality and morbidity globally but could be mitigated through accurate and timely blood pressure (BP) monitoring. Self-monitoring of blood pressure (SMBP) in pregnancy is an emerging approach for the management of HDPs but mainly studied from the perspectives of pregnant women, in high-income contexts, or tertiary care. This qualitative study explored health workers' perspectives on SMBP by pregnant women, including through using a smartphone application, within primary healthcare settings of Lombok, Indonesia.

Methods We conducted focus group discussions (FGDs) and in-depth interviews (IDIs) with community health workers, community-based midwives, facility-based midwives from primary healthcare centres, obstetrician/gynaecologists and health system managers (including heads of facilities, midwife supervisor and District Health Office administrators). Themes were grouped according to the normalisation process theory, which includes (1) coherence/understanding of the intervention, (2) cognitive participation/perceived value and (3) collective action/how the intervention will affect processes and organisational practices.

Results We recruited 68 participants across 8 FGDs and 26 IDIs. SMBP was perceived to improve timeliness of care and detection of high BP, but health workers expressed concerns about women's ability to accurately self-monitor, reliability and affordability of BP devices, and accountability and management of SMBP results. Embedding SMBP into routine antenatal care counselling, collaboration with family members, clarification on liability implications and protocols on SMBP follow-up actions, and use of digital communication channels were cited as potential ways to facilitate uptake of SMBP.

Conclusion For SMBP to be valued by health workers and effectively integrated into the health system as a strategy for addressing HDPs, it needs to be accompanied by clear clinical and data management protocols, referral mechanisms, reassurance on the accuracy and trust in the self-monitored measurements and demonstration of timeliness in the provision of follow-up care for pregnant women.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Self-monitoring of blood pressure (SMBP) by pregnant women is an emerging approach for the management of hypertensive disorders of pregnancy. The majority of this research is from the lens of pregnant women, which is critical but also needs to be complemented by health workers' perspectives for SMBP to be effectively integrated into health systems.

⇒ Prior research on health workers' views has primarily been conducted among tertiary care providers or in high-income settings. These studies indicate health workers' willingness to support SMBP by pregnant women but concerns surrounding liability and lack of clarity in clinical management protocols.

INTRODUCTION

Hypertensive disorders of pregnancy (HDPs) are one of the leading causes of maternal mortality and morbidity globally. They comprise (1) chronic hypertension, (2) gestational hypertension (hypertension identified in the latter half of pregnancy), (3) pre-eclampsia-eclampsia, which consists of gestational hypertension and proteinuria after 20 weeks of gestation, and (3) pre-eclampsia superimposed on chronic hypertension.[1–3] Routine blood pressure (BP) monitoring in pregnancy is critical for the appropriate management of HDPs and is often conducted by a healthcare provider during antenatal

The Journal of Nutrition
Biochemical, Molecular, and Genetic Mechanisms

See corresponding commentary on page 1303.

Maternal Multiple Micronutrient Supplementation Stabilizes Mitochondrial DNA Copy Number in Pregnant Women in Lombok, Indonesia

Lidwina Priliani,[1,2] Elizabeth L Prado,[3,4] Restuadi Restuadi,[1,5] Diana E Waturangi,[2] Anuraj H Shankar,[3,6] and Safarina G Malik[2]

[1]Eijkman Institute for Molecular Biology, Ministry of Research, Technology and Higher Education and, [2]Faculty of Biotechnology, Atma Jaya Catholic University of Indonesia, Jakarta, Indonesia, [3]Summit Institute of Development, Mataram, West Nusa Tenggara, Indonesia; [4]Department of Nutrition, University of California at Davis, Davis, CA, [5]Institute for Molecular Bioscience, The University of Queensland, Brisbane, Queensland, Australia; and [6]Department of Nutrition, Harvard TH Chan School of Public Health, Boston, MA

ABSTRACT

Background: The Supplementation with Multiple Micronutrients Intervention Trial (SUMMIT) in Lombok, Indonesia showed that maternal multiple micronutrients (MMN), as compared with iron and folic acid (IFA), reduced fetal loss, early infant mortality, and low birth weight. Mitochondria play a key role during pregnancy by providing maternal metabolic energy for fetal development, but the effects of maternal supplementation during pregnancy on mitochondria are not fully understood.

Objective: The aim of this study was to assess the impact of MMN supplementation on maternal mitochondrial DNA copy number (mtDNA-CN).

Methods: We used archived venous blood specimens from pregnant women enrolled in the SUMMIT study. SUMMIT was a cluster-randomized double-blind controlled trial in which midwives were randomly assigned to distribute MMN or IFA to pregnant women. In this study, we selected 108 sets of paired baseline and postsupplementation samples (MMN = 54 and IFA = 54). Maternal mtDNA-CN was determined by real-time quantitative polymerase chain reaction in baseline and postsupplementation specimens. The association between supplementation type and change in mtDNA-CN was performed using rank-based estimation for linear models.

Results: In both groups, maternal mtDNA-CN at postsupplementation was significantly elevated compared with baseline ($P < 0.001$). The regression revealed that the MMN group had lower postsupplementation mtDNA-CN than the IFA group ($\beta = -4.63$, $P = 0.003$), especially for women with mtDNA-CN levels above the median at baseline ($\beta = -7.49$, $P = 0.007$). This effect was rapid, and observed within 33 d of initiation of supplementation ($\beta = -7.39$, $P = 0.017$).

Conclusion: Maternal MMN supplementation rapidly stabilized mtDNA-CN in pregnant women who participated in SUMMIT, indicating improved mitochondrial efficiency. The data provide a mechanistic basis for the beneficial effects of MMN on fetal growth and survival, and support the transition from routine IFA to MMN supplementation. This trial was registered at www.isrctn.com as ISRCTN34151616

Keywords: supplementation, multiple micronut
number, mtDNA-CN, oxidative stress

Introduction

Deficiencies in macronutrients and micronutri
middle-income countries (LMICs) often occur
diet, dietary taboos, or illness (1, 2). Micronut
can result in adverse pregnancy outcomes inc

THE LANCET

ARTICLES | VOLUME 371, ISSUE 9608, P215-227, JANUARY 19, 2008

Effect of maternal multiple micronutrient supplementation on fetal loss and infant death in Indonesia: a double-blind cluster-randomised trial

The Supplementation with Multiple Micronutrients Intervention Trial (SUMMIT) Study Group ‡ • Show footnotes

Published: January 19, 2008 • DOI: https://doi.org/10.1016/S0140-6736(08)60133-6

PLOS ONE

RESEARCH ARTICLE

Maternal biomarker patterns for metabolism and inflammation in pregnancy are influenced by multiple micronutrient supplementation and associated with child biomarker patterns and nutritional status at 9-12 years of age

Lidwina Priliani[1], Sukma Oktavianthi[1], Elizabeth L. Prado[2,3], Safarina G. Malik[4]*, Anuraj H. Shankar[2,3,5]*

1 Eijkman Institute for Molecular Biology, Ministry of Research and Technology/National Research and Innovation Agency, Jakarta, Indonesia, 2 Summit Institute of Development, Mataram, Lombok, West Nusa Tenggara, Indonesia, 3 Department of Nutrition, University California at Davis, Davis, California, United States of America, 4 Eijkman-Oxford Clinical Research Unit, Eijkman Institute for Molecular Biology, Jakarta, Indonesia, 5 Nuffield Department of Medicine, Centre for Tropical Medicine and Global Health, University of Oxford, Oxford, United Kingdom

☯ These authors contributed equally to this work.
* anuraj.shankar@ndm.ox.ac.uk (AHS); ina@eijkman.go.id (SGM)

Citation: Priliani L, Oktavianthi S, Prado EL, Malik SG, Shankar AH (2020) Maternal biomarker patterns for metabolism and inflammation in pregnancy are influenced by multiple micronutrient supplementation and associated with child biomarker patterns and nutritional status at 9-12 years of age. PLoS ONE 15(8): e0216848. https://doi.org/10.1371/journal.pone.0216848

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Received: April 26, 2019

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Published: August 7, 2020

Abstract

Maternal nutritional status influences fetal development and long-term risk for adult non-communicable diseases. However, the underlying mechanisms remain poorly understood. We examined whether biomarkers for metabolism and inflammation during pregnancy were associated with maternal health and with child biomarkers and health at 9–12 years of age in 44 maternal-child dyads from the Supplementation with Multiple Micronutrients Intervention Trial (SUMMIT, ISRCTN34151616) in Lombok, Indonesia. Archived blood for each dyad from maternal enrollment, later in pregnancy, postpartum, and from children at 9–12 years comprised 132 specimens. Multiplex microbead immunoassays were used to quantify vitamin D-binding protein (D), adiponectin (A), retinol-binding protein 4 (R), C-reactive protein (C), and leptin (L). Principal component analysis (PCA) revealed distinct variance patterns, i.e. principal components (PC), for baseline pregnancy, bp.pc1.D↑A↓R↓ and bp.pc2.C↓L↑; combined follow-up during pregnancy and postpartum, dp-pp.pc1.D↑|A↑R↑|L↓ and dp-pp.pc2.A↑C↓L↑; and children, ch.pc1.D↑R↑C↑ and ch.pc2.D↓A↓L↓. Maternal multiplex micronutrient (MMN) supplementation led to an association of baseline maternal bp.pc2.

n maternal dp-pp.pc2.A↑C↑L↑ ($p = 0.022$), which child ch.pc1.D↑R↑C↑ ($p = 0.036$) and decreased er analyses revealed an association between ased child BMIZ ($p = 0.036$). Child ch.pc1. th weight ($p = 0.036$) and increased child BMIZ ciated with increased child BMIZ ($p = 0.005$), girls ($p = 0.002$). A pattern of elevated maternal sociated with increased C-reactive protein,

DOI: 10.1002/ijgo.12732

SUPPLEMENT ARTICLE

WILEY

The effect of Expanding Maternal and Neonatal Survival interventions on improving the coverage of labor monitoring and complication prevention practices in hospitals in Indonesia: A difference-in-difference analysis

Maya Tholandi[1,*] | Reena Sethi[2] | Alisa Pedrana[3] | Situ Nurul Qomariyah[1] | Dwirani Amelia[4] | Pancho Kaslam[5] | Sudirman Sudirman[6] | Mandri S. Apriatni[6] | Agus Rahmanto[4] | Mark Emerson[7] | Saifuddin Ahmed[7]

[1]Jhpiego Indonesia, Jakarta, Indonesia
[2]Jhpiego, Baltimore, MD, USA
[3]Disease Elimination Program, Burnet Institute, Melbourne, Victoria, Australia
[4]Budi Kemuliaan Health Institute, Jakarta, Indonesia
[5]Save the Children, Jakarta, Indonesia
[6]Summit Institute of Development, Mataram, Indonesia
[7]Bloomberg School of Public Health, Johns Hopkins University, Baltimore, MD, USA

*Correspondence
Maya Tholandi, Jhpiego, Baltimore, MD, USA.
Email: Maya.tholandi@jhpiego.org

Funding Information
United States Agency for International Development (USAID)

Abstract

Objective: To assess whether the Expanding Maternal and Neonatal Survival (EMAS) program was associated with improved care provided during hospital-based childbirth.

Methods: A quasi-experimental study with two rounds of data collection examined whether EMAS interventions improved facility-based labor and childbirth care. Direct clinical observations were conducted for 1208 deliveries across 13 hospitals in 12 districts. Primary outcome measures included implementation of standard practices to reduce the risk of complications during labor and childbirth for both women and newborns.

Results: Adjusted difference-in-difference analysis compared the mean difference in quality scores between EMAS intervention hospitals and comparison sites and consistently found significantly better performance in EMAS sites: 14 points higher for labor monitoring (β-coefficient 14.1; 95% confidence interval [CI], 7.1–21.0); 38 points higher for newborn resuscitation readiness (β-coefficient 38.1; 95% CI, 31.1–45.2); and 33 points higher for infection prevention practices (β-coefficient 32.6; 95% CI, 28.5–36.8).

Conclusion: EMAS approaches emphasizing facility readiness and adherence to performance standards significantly improved labor monitoring and complication prevention practices during childbirth.

KEYWORDS

Indonesia; Infection prevention; Labor monitoring; Newborn resuscitation readiness; Quality of care

DOI: 10.1002/ijgo.12730

SUPPLEMENT ARTICLE

WILEY

Assessing the effect of the Expanding Maternal and Neonatal Survival program on improving stabilization and referral for maternal and newborn complications in Indonesia

Alisa Pedrana[1,*] | Siti Nurul Qomariyah[2] | Maya Tholandi[2] | Bambang Wijayanto[3] | Trisnawaty Gandawidjaja[4] | Dwirani Amelia[5] | Mandri Apriatni[6] | Sudirman Sudirman[6] | Ali Zazri[2] | Reena Sethi[7] | Mark Emerson[8] | Saifuddin Ahmed[8]

[1]Disease Elimination Program, Burnet Institute, Melbourne, Vic., Australia
[2]Jhpiego Indonesia, Jakarta, Indonesia
[3]Research Triangle International, Jakarta, Indonesia
[4]Save the Children, Jakarta, Indonesia
[5]Research and Development Unit, Budi Kemuliaan Health Institute, Jakarta, Indonesia
[6]Summit Institute of Development, Lombok, Indonesia
[7]Jhpiego, Baltimore, MD, USA
[8]Bloomberg School of Public Health, Johns Hopkins University, Baltimore, MD, USA

*Correspondence
Alisa Pedrana, Burnet Institute, Melbourne, Victoria, Australia.
Email: alisa.pedrana@burnet.edu.au

Funding Information
United States Agency for International Development (USAID)

Abstract

Objective: To determine if the Expanding Maternal and Neonatal Survival (EMAS) program was associated with improved effectiveness of the referral system in Indonesia to facilitate timely and effective management of complications experienced by women and newborns.

Methods: Poisson regression using longitudinal monitoring data was used to assess the impact of the EMAS program on stabilization practices prior to referral. Data from a nonrandomized quasi-experimental pre-post evaluation study were used to assess the impact of the EMAS program along the referral pathway using χ^2 analysis.

Results: Monitoring data demonstrated improvements in intervention areas for stabilization of pre-eclampsia/eclampsia (24% vs 61%, incidence rate ratio [IRR] 2.4; 95% confidence interval [CI], 2.3–2.6) and treatment of newborns with suspected severe infection (30% vs 54%, IRR 2.0; 95% CI, 1.6–2.4) prior to referral. The EMAS program was associated with significantly higher levels of communication, advanced notification, back referral, and hospital emergency readiness and staff preparedness compared with the comparison arm.

Conclusion: The EMAS program contributed to improvements in the management of obstetric and newborn complications, including communication, transportation, and preparation of pregnant mothers in need of referral and hospital emergency readiness and staff preparedness.

KEYWORDS

Health facility delivery; Indonesia; Maternal health; Monitoring and surveillance; Referral

1 | BACKGROUND

Indonesia, the world's fourth largest population, continues to struggle with high maternal mortality despite two decades of major investments by government and nongovernment sectors in national programs.[1–7] Disparities exist between different provinces in terms of the proximity to the capital, economy, education, household wealth, and infrastructure, with better availability and access to basic services,

JOURNAL OF MEDICAL INTERNET RESEARCH Haddad et al

Original Paper

Building a Digital Tool for the Adoption of the World Health Organization's Antenatal Care Recommendations: Methodological Intersection of Evidence, Clinical Logic, and Digital Technology

Samira M Haddad[1,2], MSc, MD, PhD; Renato T Souza[1,2], MSc, MD, PhD; Jose Guilherme Cecatti[1,2], MSc, MD, PhD; Maria Barreix[3], MHS; Tigest Tamrat[3], MPH; Carolyn Footitt[4], MSPH; Garrett L Mehl[3], PhD; Inraini F Syah[5], MPH; Anuraj H Shankar[3,6,7], PhD; Özge Tunçalp[3], MD, PhD

[1]Department of Obstetrics and Gynecology, School of Medical Sciences, University of Campinas, Campinas, Brazil
[2]Center for Research in Reproductive Health of Campinas (CEMICAMP), Campinas, Brazil
[3]UNDP-UNFPA-UNICEF-WHO-World Bank Special Programme of Research, Development and Research Training in Human Reproduction (HRP), Department of Reproductive Health and Research, World Health Organization, Geneva, Switzerland
[4]Ona Systems Inc, Nairobi, Kenya
[5]Summit Institute of Development, Mataram, Indonesia
[6]Centre for Tropical Medicine and Global Health, Nuffield Department of Medicine, University of Oxford, Oxford, United Kingdom
[7]Eijkman-Oxford Clinical Research Unit, Eijkman Institute for Molecular Biology, Jakarta, Indonesia

Corresponding Author:
Jose Guilherme Cecatti, MSc, MD, PhD
Department of Obstetrics and Gynecology
School of Medical Sciences
University of Campinas
101 Alexander Fleming Street
University of Campinas
Campinas, 13083-891
Brazil
Phone: 55 1935219482
Email: cecatti@unicamp.br

Related Article:
This is a corrected version. See correction statement in: https://www.jmir.org/2020/10/e24891/

Abstract

Background: One of the key mandates of the World Health Organization (WHO) is to develop guidelines, defined as "a document containing recommendations for clinical practice or public health policy." Guidelines represent the global standard for information sources shaping clinical practice and public health policies. Despite the rigorous development process and the value of guidelines for setting standards, implementing such standards within local contexts and at the point of care is a well-documented challenge. Digital technologies enable agile information management and may facilitate the adaptation of guidelines to diverse settings of health services delivery.

Objective: The objective of this paper is to detail the systematic and iterative process involved in transforming the WHO Antenatal Care (ANC) guidelines into a digital decision-support and patient-record application for routine use in primary health care settings, known as the WHO digital ANC module.

Methods: The WHO convened a team of clinical and digital health experts to develop the WHO digital ANC module as a tool to assist health care professionals in the implementation of WHO evidence-based recommendations for pregnant women. The WHO digital ANC module's creation included the following steps: defining a minimum viable product (MVP), developing clinical workflows and algorithms, algorithm testing, developing a data dictionary, and the creation of a user interface or application development. The overall process of development took approximately 1 year to reach a stable prototype and to finalize the underlying content requirements of the data dictionary and decision support algorithms.

Results: The first output is a reference software reflecting the generic WHO ANC guideline content, known as the WHO digital ANC module. Within it, all actionable ANC recommendations have related data fields and algorithms to confirm whether the

QUANTITATIVE RESEARCH

An impact evaluation of Plan Indonesia's early childhood program

Frances E. Aboud, PhD,[1] Kerrie Proulx, PhD,[2] Zaitu Astilla, BA[3,4]

ABSTRACT

OBJECTIVES: High-quality preschools are known to prepare children for success in primary school. Over half of Indonesia's children now pass through preschools whose quality and effectiveness are unknown. Our goal was to evaluate two government preschool models, namely kindergarten (TK) and the less formal health-post (PAUD), with and without capacity-building efforts of a non-governmental organization (NGO-Plan), on children's language and math skills.

METHODS: Thirteen TK and 17 PAUD Plan-supported and the same number of government-supported preschools were randomly selected from East Nusa Tenggara, Indonesia. Five children from each ($n = 292$) and five who had graduated from each and were now in first grade ($n = 241$) were randomly selected and tested on language and math measures. The Plan-supported preschools were assessed for quality. Mothers reported on their family's socio-demographic situation and their child's preventive health practices, illnesses and diet over the previous two weeks.

RESULTS: Analyses of covariance adjusting for clusters indicated that children attending Plan-supported preschools performed better overall, and especially those in TK preschools. Plan-supported TKs were observed to have higher quality than Plan-supported PAUDs. First graders who graduated from Plan-supported preschools, both TK and PAUD, achieved higher scores on language and math tests than government-supported graduates. Preventive health practices were better in the Plan group, though diet and height-for-age were poor overall.

CONCLUSIONS: Upgrades to the government preschool program are needed to raise its quality and effectiveness, specifically by introducing a mix of instructional and indoor free-choice play, resources and teacher training to support children's learning.

KEY WORDS: Preschool; classroom quality; early childhood education; LMIC; capacity building; school readiness

La traduction du résumé se trouve à la fin de l'article.

Can J Public Health 2016;107(4-5):e366-e372
doi: 10.17269/CJPH.107.5557

Most South-East Asian countries, including Indonesia, reached the Millennium Development Goal regarding universal primary education, and so are developing policies to prepare children better for primary school. This commonly takes the form of setting standards and guidelines for preprimary care and education for children four to six years of age. Indonesian children in the province of East Nusa Tenggara need this kind of support before entering primary school because families are unprepared to provide an adequately healthy environment. For example, poor hygiene means that many children become sick, and their diets lack sufficient diversity for adequate growth.[1–3] Because of their remote location, they are worse off than the national average in their access to and use of education, media and health services.[3] The likelihood is high that children under five years of age are not reaching their mental development potential due to lack of appropriate health care, stimulation and nutrition.[4] The current study compared two models of preprimary educational services for children and evaluated how a non-governmental organization's (NGO) support with teacher training and program improvement benefited children.

Over the past decade, different models of preprimary (called preschool) programming have been evaluated in South-East Asia,[1,4] South Asia[5,6] and Africa.[6,10] Reviews of these studies and others have concluded that most preschool models demonstrate clear benefits for children on measures of school readiness.[11] The positive impact of preschool on children's school readiness is remarkably robust across different social and economic contexts in low- and middle-income countries. However, maintaining those advances into primary school is more difficult and results here are mixed.[7,10,12] To prevent fading, programs may need a higher level of quality.[13]

Indonesia currently has preprimary gross enrollment of more than 55%, with equal participation of boys and girls.[14] Two evaluations have recently been conducted of preprimary programs. In the small eastern province of Belu, Save the Children found significantly higher school readiness skills among children who had attended Save's preschool than among those who did not.[15] Yet, a national evaluation of government preschools in 310 villages found little effect on language or cognitive skills.[16] The findings suggest that the government program needs improvement if it is to benefit children's development.

Two early education models exist in rural Indonesia: Taman Kanak-Kanak (TK) is located near a primary school and Pendidikan

Author Affiliations
1. Department of Psychology, McGill University, Montreal, QC
2. Ontario Institute for Studies in Education, University of Toronto, Toronto, ON
3. Yayasan Zaitunah (Foundation), Jakarta, Indonesia
4. Consultant for SUMMIT Institute of Development, Mataram, Lombok, Indonesia
Correspondence: Frances Aboud, PhD, Department of Psychology, McGill University, 1205 Dr Penfield Avenue, Montreal, QC H3A 1B1, Tel: 514-398-6099, E-mail: frances.aboud@mcgill.ca

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Conflict of Interest: None to declare.

Maternal multiple micronutrient supplementation and other biomedical and socioenvironmental influences on children's cognition at age 9–12 years in Indonesia: follow-up of the SUMMIT randomised trial

Elizabeth L Prado, Suzy K Sebayang, Mandri Apriatni, Siti R Adawiyah, Nina Hidayati, Ayunsatti Islamiyah, Sudirman Siddiq, Benyamin Harefa, Jamal Lum, Katherine J Alcock, Michael T Ullman, Husni Muadz, Anuraj H Shankar

Summary

Background Brain and cognitive development during the first 1000 days from conception are affected by multiple biomedical and socioenvironmental determinants including nutrition, health, nurturing, and stimulation. An improved understanding of the long-term influence of these factors is needed to prioritise public health investments to optimise human development.

Methods We did a follow-up study of the Supplementation with Multiple Micronutrients Intervention Trial (SUMMIT), a double-blind, cluster-randomised trial of maternal supplementation with multiple micronutrients (MMN) or iron and folic acid (IFA) in Indonesia. Of 27 356 live infants from birth to 3 months of age in 2001–04, we re-enrolled 19 274 (70%) children at age 9–12 years, and randomly selected 2879 from the 18 230 who were attending school at a known location. Of these, 574 children were oversampled from mothers who were anaemic or malnourished at SUMMIT enrolment. We assessed the effects of MMN and associations of biomedical (ie, maternal and child anthropometry and haemoglobin and preterm birth) and socioenvironmental determinants (ie, parental education, socioeconomic status, home environment, and maternal depression) on general intellectual ability, declarative memory, procedural memory, executive function, academic achievement, fine motor dexterity, and socioemotional health. The SUMMIT trial was registered, number ISRCTN34151616.

Findings Children of mothers given MMN had a mean score of 0·11 SD (95% CI 0·01–0·20, p=0·0319) higher in procedural memory than those given IFA, equivalent to the increase in scores with half a year of schooling. Children of anaemic mothers in the MMN group scored 0·18 SD (0·06–0·31, p=0·0047) higher in general intellectual ability, similar to the increase with 1 year of schooling. Overall, 18 of 21 tests showed a positive coefficient of MMN versus IFA (p=0·0431) with effect sizes from 0·00–0·18 SD. In multiple regression models, socioenvironmental determinants had coefficients of 0·00–0·43 SD and 22 of 35 tests were significant at the 95% CI level, whereas biomedical coefficients were 0·00–0·10 SD and eight of 56 tests were significant, indicating larger and more consistent impact of socioenvironmental factors (p<0·0001).

Interpretation Maternal MMN had long-term benefits for child cognitive development at 9–12 years of age, thereby supporting its role in early childhood development, and policy change toward MMN. The stronger association of socioenvironmental determinants with improved cognition suggests present reproductive, maternal, neonatal, and child health programmes focused on biomedical determinants might not sufficiently enhance child cognition, and that programmes addressing socioenvironmental determinants are essential to achieve thriving populations.

Funding Grand Challenges Canada Saving Brains Program.

Introduction

Determinants that influence brain and cognitive development during the first 1000 days from conception to 2 years of age can have long-term effects on brain architecture and cognitive ability.[1] Studies in high-income countries have shown the long-term cognitive consequences of early life experiences, such as intrauterine growth restriction,[2] preterm birth,[3] adverse events,[4] and early educational experiences.[5] Children in low-income and middle-income countries (LMICs) have a greater burden of risk factors for poor cognitive and behavioural development than those in high-income countries.[6] However, few studies in LMICs have assessed the association between early life experiences and later cognitive, motor, and socio-emotional ability. Identification of the biomedical and socioenvironmental determinants that most strongly predict cognitive, motor, and socioemotional function is needed for strategic design and integration of child development programmes with existing reproductive,

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Summit Institute of Development, Mataram, Nusa Tenggara Barat, Indonesia (E L Prado PhD, S K Sebayang PhoD*, M Apriatni MA, SR Adawiyah BS, N Hidayati BS, A Islamiyah BS, S Siddiq BS, B Harefa BS, H Muadz PhD, AH Shankar DSc); Department of Nutrition, University of California Davis, Davis, CA, USA (E L Prado); School of Psychology, Deakin University, Melbourne, VIC, Australia (J Lum PhD); Psychology Department, Lancaster University, Bailrigg, Lancaster, UK (K J Alcock DPhil); Department of Neuroscience, Georgetown University, Washington, DC, USA (MT Ullman PhD); Center for Research on Language and Culture, University of Mataram, Mataram, Nusa Tenggara Barat, Indonesia (H Muadz); and Department of Nutrition, Harvard TH Chan School of Public Health, Boston, MA, USA (A H Shankar DSc)

*Present affiliation is Faculty of Public Health, University of Airlangga, Banyuwangi Campus, Banyuwangi, Indonesia

Correspondence to:
Dr Anuraj Shankar, Summit Institute of Development, Jl Bung Hatta No 2B, Mataram, Nusa Tenggara Barat, Indonesia
ashankar@hsph.harvard.edu

COLLABORATION

SID maintained and strengthened strategic partnerships with key stakeholders identified in previous cycles, which will continue to be cultivated for future collaboration. Additionally, SID reached out to new stakeholders, aiming to secure their support. These stakeholders include both government agencies and private sector organizations:

Engagement with New Local Governments: SID has expanded advocacy to Lombok Tengah and Lombok Utara district for the implementation of NextGen and has secured MOU to implement NextGen.

Ongoing Partnerships with Local Governments: Continued collaboration with local governments in West Nusa Tenggara Province and West Java ensures consistent implementation and scaling of the NextGen initiative within these districts

Collaboration with Technology and Innovation Partners: SID continues to partner with Sight and Life, along with tech collaborators such as ONA, IPRD, Google, and the WHO SMART Guidelines Working Group, to enhance NextGen's capacity to deliver impactful health interventions effectively.

SID, in collaboration with professional associations such as IDI, IBI, and Bapelkes.

Partnerships with Academic and Global Institutions: SID maintains strong collaborations with partners and academic institutions to drive digital health transformation in Indonesia. Key partners include the World Health Organization (WHO), Bill and Melinda Gates Foundation, Grand Challenges Canada, Oxford University Clinical Research Unit (OUCRU) Indonesia, ThinkWell, USAID, CISDI, University of Indonesia, University of Mataram, University of Oxford, Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australian National University (ANU), and GSI Lab. Recently, we also have partnerships with CIFF (Children's Investment Fund Foundation) for the MMS project, and the Australian government for the KONEKSI project.

SUMMIT INSTITUTE FOR DEVELOPMENT

Jl. Sultan Hasanuddin No. 137B, Karang Taliwang, Mataram, 83238, Indonesia
secretariat@sid-indonesia.org
www.sid-indonesia.org