ACADEMIC BUNDLE OF CREATIONS

ABDUCENS

PCC EAMSC 2027: CHINA
By AMSA-Unhas 2026/2027

Converge Case Challenge

DIJAMU: DIGITAL IDENTIFICATION OF JAMU UTILIZATION AND MEDICATION

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DISTRICT 6 WINNER



INTRODUCTION

In Cendana Raya, a district in West Java,

Mrs. Haerani

She takes tablets for high blood pressure. Every evening, she also drinks her family's home-made jamu. Nobody knows exactly what is in it.

*illustrative patient



INTRODUCTION

BUT THREE THINGS GO WRONG

Nobody asks her about jamu and she doesn't mention it because she fears being criticised.

Even if she were asked, the hospital's screening system wouldn't recognise her jamu, because it mainly covers packaged products.

As a result, nobody checks whether her jamu and tablets are safe together.



Mrs. Haerani is not alone,

- 40% of patients use herbal products, but only 21% of records mention it.
- The system flags 72% of packaged products, but only 40% of local jamu.
- Only 11.5% of records include a safety check.

INTRODUCTION — Why does it matter?

Jamu is part of Indonesia's health system

31.4%
of Indonesian households used traditional health services[1]

62.9%
reported that reaching a hospital was difficult or very difficult[1]

Supported by policy

The Ministry of Health promotes jamu for prevention[2] and the WHO calls for its safe, respectful integration into health systems.[3]

The risk is real, but not universal

- Some herbs may interact with medicines, although the evidence varies.[4]
- In 2024, BPOM seized over 200,000 units of suspect herbal products in West Java.[5]
- This does not mean all jamu is unsafe.

INTRODUCTION — Root causes

Patients
Patients are afraid of being judged, so they do not talk about their jamu.

Health Workers
- Doctors rarely ask about or record jamu use.
- Doctors fear too many warnings will add to their workload.

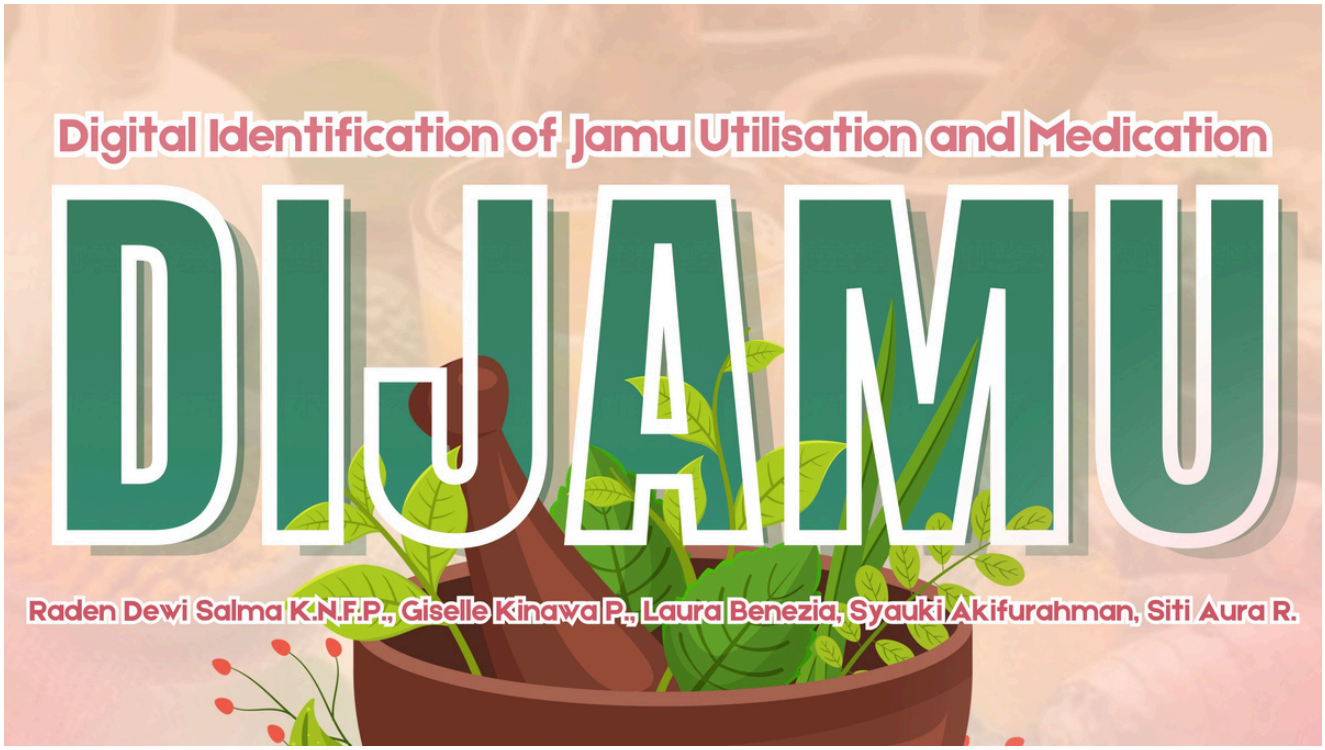
System
The system mostly knows products from Malaysia and China, so it often misses local jamu. It missed 18 of 30 local jamu cases, but only 7 of 25 packaged products.

Resources
- Only 3 of 10 Puskesmas have a pharmacist.
- 3 remote areas have poor internet.
- Health workers also can't update the system.

Governance
The Malaysian partner wants to store patient data overseas. Jamu makers worry they will not get credit for their knowledge. A decision is needed within 8 weeks.

Problem
Jamu taken alongside prescribed medicines is rarely checked for safety, because its use is not recorded and the screening system often misses local jamu.


INTRODUCTION
OBJECTIVES
• Ask: record jamu use in more adult outpatient visits across all 10 Puskesmas and the hospital.
• Recognise: help the system detect local jamu as well as packaged products, without losing accuracy for packaged ones.
• Check: give more jamu users a recorded and culturally respectful safety assessment.
TARGET AUDIENCE
• Primary: Doctors, Pharmacists, Community health volunteers (kader), Jamu Consumers, and Patients.
• Secondary: District health office, Ministry of health, Puskesmas, BPOM, Jamu producers and distributors, and Malaysian partner.


Digital Identification of Jamu Utilisation and Medication
DIJAMU
Raden Dewi Salma K.N.F.P., Giselle Kinawa P., Laura Benezia, Syauki Akifurahman, Siti Aura R.

EXISTING RESOURCES

- Natural Product-Drug Interaction Database (NaPDI)[6]
- Kew Medicinal Plant Names Services (Kew MPNS)[7]
- Riset Tumbuhan Obat dan Jamu (RISTOJA)[8–9]
- Kamus Farmasi dan Alat Kesehatan (KFA)[10]
- BPOM (National Agency of Drug and Food Control)

RESEARCH GAPS

- Limited Local Evidence
- Fragmented Data
- Limited Clinical Application

WHAT DOES DIJAMU ADD?

- Local Interaction Database
- Data Integration
- Expert Validation
- Clinical & Public Access
- Regional Collab

PROGRAMME FLOW:

Community Preparation & Training → Tanya Jamu → Jamu Data Collection → Regional Data Collaboration

↓

DIJAMU Database Development → Jamu-Drug Interaction Screening → Development of Information Tools → Clinical Application & Community Education

↓

GOAL Safer and More Rational Jamu Use

COMMUNITY PREPARATION & TRAINING

TARGET PARTICIPANTS

Kader | **Doctors**

↓

Jamu Knowledge
Introduction to jamu and commonly used ingredients.

Communication Skills
How to ask about jamu use through appropriate interviews.[11]

Ethical Awareness
Informed consent, confidentiality, and responsible data collection.

Data Documentation
How to record jamu use using standardised forms.

↓

EXPECTED OUTPUT Trained and Prepared Data Collectors

TANYA JAMU & JAMU DATA COLLECTION

COMMUNITY ENGAGEMENT

Trained community health volunteers and doctors approach local communities

Local Community
Jamu consumers and households

Jamu Producers
Local jamu producer

Interview (Appendix C)

- Names of packaged products consumed or sold
- Vernacular names of medicinal plants
- Traditional uses of each jamu ingredient
- Frequency and quantity of jamu consumption
- Medicinal plant ingredients in each packaged products

Expected Output
Initial Mapping of Local Jamu Practices

REGIONAL DATA COLLABORATION

INDONESIA

MALAYSIA

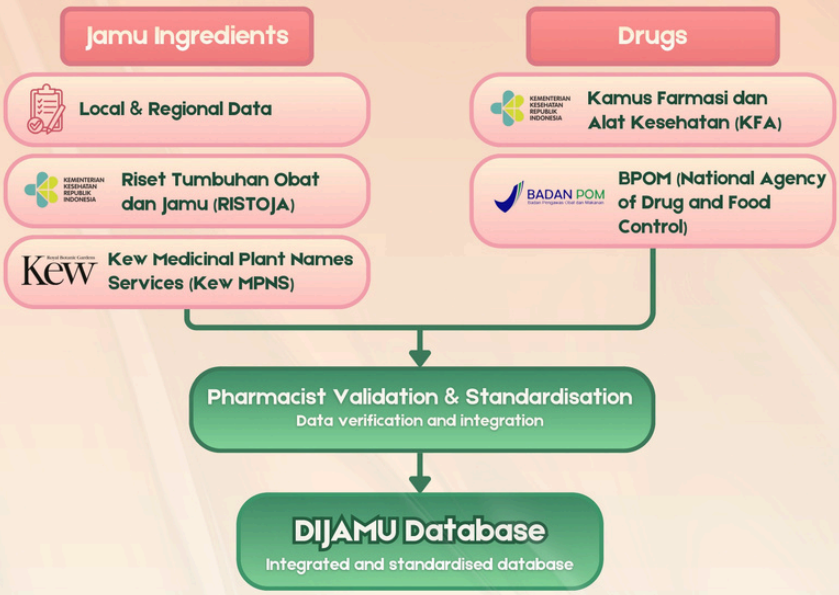
DATA EXCHANGE
Exchange medicinal plant data from both countries.

SHARED SPECIES MAPPING
Identify medicinal plant species shared by Indonesia and Malaysia.

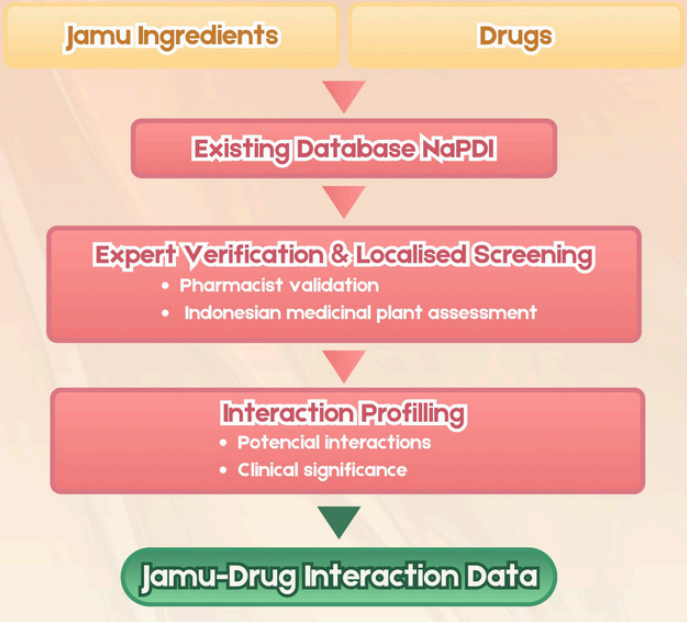
IDENTIFY LOCAL KNOWLEDGE DOCUMENTATION
Document differences in local names and traditional uses.

EXPECTED OUTPUT
Expanded Regional Medicinal Plant Dictionary.

DIJAMU DATABASE DEVELOPMENT



JAMU-DRUG INTERACTION SCREENING



DEVELOPMENT OF INFORMATION TOOLS

DIJAMU Database
Validated jamu-drug interaction information

INFORMATION TOOL DEVELOPMENT

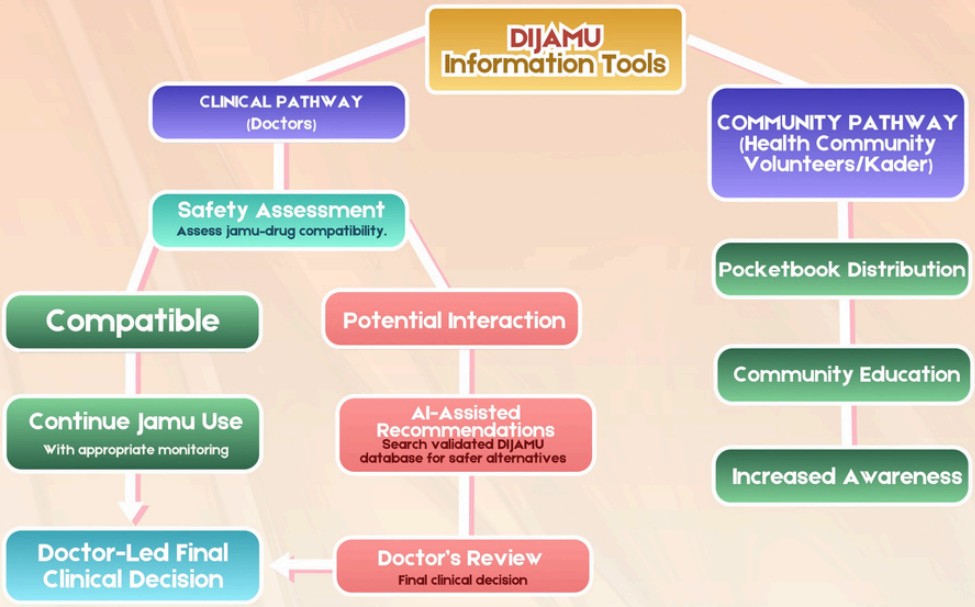
Doctor-Facing Application

- Interaction checking
- Safety assessment
- Clinical recommendations

Community Pocketbook

- Safe jamu use
- Potential Risks

CLINICAL APPLICATION & COMMUNITY EDUCATION



BUILT TO WORK OFFLINE

21% of Indonesian Puskesmas

2,180 of 10,382 Puskesmas have limited or insufficient internet access[12]

OFFLINE-FIRST!

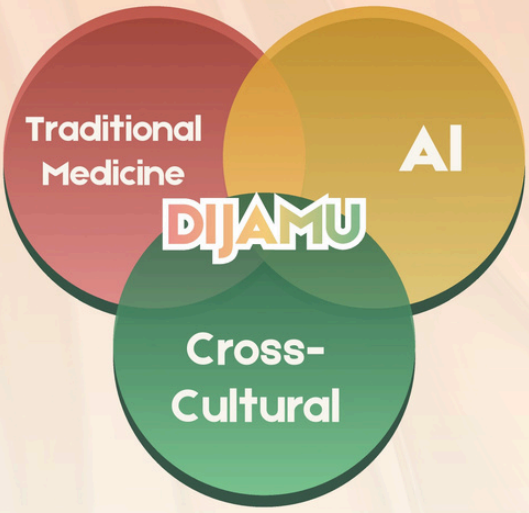
Offline-first EHR

- Automatic synchronisation
- Offline patient records

DHIS2 Android

- Offline data validation and synchronisation[13]

How DIJAMU integrates the three subthemes



Traditional Medicine

- Document local jamu knowledge
- Validate with local practitioners
- Protect traditional knowledge

AI-Medicine Integration

- Suggest safer jamu alternatives

Cross-Cultural Exchange

- Collaborate with Malaysia
- Exchange plant names and terminology and protect patient data

PENTAHELIX COLLABORATION (+ INTERNATIONAL PARTNER)



WHAT WE DELIVER

Application:
Helps doctors check jamu offline and updates the local jamu database when online.

Community Education:
Sessions on safe jamu use, led by trained community health volunteers.

Pocketbook:
A simple public guide to jamu and medicines, updated every year.

SHORT-TERM OUTCOMES (Month 6)

Ask
Jamu use is recorded in ⩾35% of consultations up from 21%.

Recognise
the system detects ⩾57% of local jamu that needs review, up from 40%. This narrows the gap with packaged products from 32 to ⩽10 points, while packaged detection stays at ⩾72%.

The doctor app is used routinely in all 11 facilities.

MEDIUM-TERM OUTCOMES (Month 12)

⩾70% of patients who use jamu with prescribed medicines receive a recorded safety assessment, and ⩾80% of them say they did not feel judged.

Patients become more open about their jamu use.

People who buy medicines or jamu on their own, and rarely visit a clinic, are reached through kader and the pocketbook.

EXPECTED IMPACT & SAFETY MONITORING

BY MONTH 12

21% → 85%
of consultations with jamu status documented

40% → 75%
of local jamu cases detected by the system

18 → 7
at-risk local-jamu cases missed (out of 30)

Safety indicators

- Patients stopping medicines without advice: <5%
- Alerts per 100 visits
- Proportion of alerts overridden
- Consultation duration

Evaluation

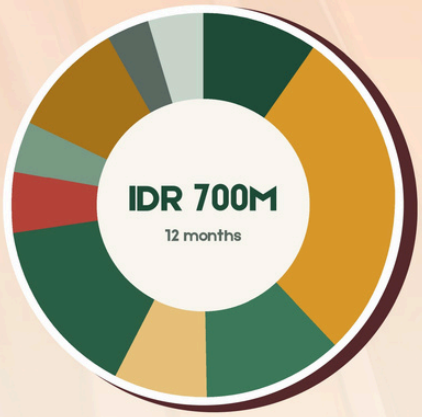
- Medical-record review at months 0, 6, and 12
- 60 validation cases per round (95% CI about ±12 points)
- Long term (not claimed within 12 months): replication in other districts and integration with RISTOJA
- Programme outputs (kader trained, sessions held, pocketbook) tracked in Appendix B

12-Month Roadmap

MONTHS	ACTIVITIES	MILESTONES
1	Baseline audit, workshops, team decree; train doctors and kader	MoU + Team Establishment
2	MoU (within 8 weeks), Kader community interviews; build the dictionary, and translation layer; draft the pocketbook	Dictionary v1 + pocketbook draft
3–4	Pilot at the district hospital + 4 Puskesmas (incl. 1 remote); community education sessions	Pilot live in 5/11 facilities; first education sessions held
5–8	Scale up to all 11 facilities; fairness audit; distribute the pocketbook	all 11 facilities covered, with documentation ⩾35%, local jamu detection ⩾57%, packaged product detection ⩾72%, and unadvised medication stops <5%.
9–12	Evaluation, formal institutional decree, APBD proposal, dictionary and pocketbook publication, as well as renewal for new jamu variants	Final report; pocketbook published

BUDGET

IDR 700 million
(within the IDR 600–800 million allocation)



ITEM	IDR MILLION	%
Governance	68.0	9.7
Dictionary	198.0	28.3
Translation layer	82.0	11.7
Tanya Jamu & training	55.0	7.9
Real-time devices	105.6	15.1
Validation	36.0	5.1
Community education & kader	30.0	4.3
Monitoring & evaluation	68.0	9.7
Benefit-sharing	25.0	3.6
Contingency	32.4	4.6

Total: IDR 700.0 million (100%)

Recurring cost after year 1: about IDR 72 million per year.
All prices are planning assumptions; yearly pocketbook updates not yet costed — breakdown in Appendix A.

SMART Targets

Indicator	Baseline	Month 6	Month 12
Jamu status documented	21%	≥35%	≥85%
Local jamu detected	40%	≥57%	≥75%
Packaged products detected	72%	≥72%	≥72%
Fairness gap (percentage points)	32	≤10	≤5
Safety assessment in jamu + prescription users	Measured in month 1	≥40%	≥70%
Doctor knows the contents of the patient's jamu	43%	–	≥70%

Goal 1 · Patient Documentation

S Patient consultations with a prescription at 11 facilities
M Measured by medical-record review and interviews
A Interviews administered by trained community health cadres
R A prerequisite for safety assessment
T Months 3 and 4

Goal 2 · Producent Documentation

S Informal jamu producers across the areas of all 11 Puskesmas in Cendana Raya.
M Measured by interviews
A Interviews administered by trained community health cadres using a non-punitive approach
R Core prerequisite to expand the district formulary
T Months 3 and 4

Goal 3 · Detection & Identification

S Sensitivity: local jamu vs standardised products
M Measured by independent review of 60 cases
A Dictionary seeded from RISTOJA + MPNS
R Reduces algorithmic bias against traditional indigenous medicines
T Months 3 and 4

Goal 4 · Clinical Safety Assessment

S Screen jamu-drug interactions for dual users
M Medical record audit
A Support from the 3 existing pharmacists
R Mitigates jamu-drug interaction risks and adverse drug events
T 5 to 12 months

SWOT ANALYSIS

STRENGTHS

Always ready at the point of care; non-judgemental screening; kader link clinic and community

WEAKNESSES

Adds time to history-taking; dictionary curation takes time; small validation sample; extra workload for kader; rural areas network availability

OPPORTUNITIES

National database integration; Producer recognition & benefit-sharing; clear decision framework; future knowledge expansion

THREATS

Uncertain data-transfer rules; illegal products in circulation[5] practitioner or producer reluctance

SO STRATEGY

Use RISTOJA, MPNS and kader interviews to build the dictionary faster

WO STRATEGY

The Malaysian partner trains local curators

ST STRATEGY

Kader-led outreach; involve practitioners from the start

WT STRATEGY

Flexible interview questions

PESTLE ANALYSIS

P — POLITIC

WHO Traditional Medicine Strategy 2025-2034[3]; Ministry of Health promotion of jamu[2]

E — ECONOMIC

Affordability-Driven Healthcare Choice; Increase health cost burden

S — SOCIAL

Traditions that have passed down across generations; stigma; non-judgemental communication through trained kader

T — TECHNOLOGICAL

Offline-first app that syncs when connected[12–14]; Making drug databases accessible

L — LEGAL

Data Sovereignty & Traditional IP Protection[15–17]; Regional Medical Regulations[18–19]; Local-Specific Legitimacy; Securing traditional knowledge

E — ENVIRONMENTAL

Some medicinal plants are becoming hard to obtain, and 85% of these have no conservation efforts[20]; Herbal preferences shaped by local geography and climate

MITIGATION PLANS

Risk	Mitigation
Name mismatch → false sense of security[21]	Double curation + identity testing + quarterly audit
Added time burden for doctors	Only 3 questions; consultation duration monitored
Alert fatigue	Tiered alerts[22]; monitor the proportion of alerts overridden
Patients stopping medicines without advice	Education; indicator <5%
Practitioners decline to share knowledge	Benefit-sharing + contributors named
Malaysian partner withdraws	Dictionary can still be built from RISTOJA + MPNS
Kader overload or turnover	Short interview guide; refresher training
Producers do not share recipes	Open, persuasive approach; recognition; consent
Pocketbook read as endorsing jamu	Evidence-only content; academic review; yearly update

Full register with likelihood, impact, contingency plans and owners: Appendix E

LIMITATIONS

The components have never been tested together → A pilot is needed

The problem lies in the dictionary – not in the AI.

Tanya Jamu ▶ DIJAMU Dictionary ▶ Translation layer ▶ Real-time intervention ▶ Fairness audit[23]

Foundation: kader and practitioner partnership · knowledge comes in, patient data stays here

21% → 85%
jamu status documented

40% → 75%
local jamu detected

18 → 7
at-risk cases missed (of 30)

RECOMMENDATIONS

1. Build the local jamu dictionary with kader and practitioners, make it a regional standard and link it to RISTOJA
2. Require fairness audits for AI-based screening systems
3. Use the knowledge-exchange model for international collaboration
4. Fund recurring costs (incl. yearly pocketbook updates) through the regional budget (APBD) and replicate in other districts

We gratefully thank

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The authors declare no conflict of interest.

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Appendix A: Budget detail — IDR 700,000,000 (prices are planning assumptions)

Code	Activity	Unit × quantity × price	Total (IDR)
A1	Stakeholder workshops	2 events × 15M	30,000,000
A2	Legal review of MoU & benefit-sharing	1 package × 20M	20,000,000
A3	Steering committee meetings	12 months × 1.5M	18,000,000
B1	Focus groups (3 communities × 4 sessions)	12 sessions × 5M	60,000,000
B2	Honoraria for jamu-practitioner informants	45 people × 1M	45,000,000
B3	Academic curation	6 months × 8M	48,000,000
B4	Ingredient identity testing	60 samples × 750k	45,000,000
C1	Translation layer development + offline mode	1 package × 70M	70,000,000
C2	Local server	12 months × 1M	12,000,000
D1	Back-up forms & education cards	1 package	10,000,000
D2	Doctor & nurse training (2 days)	60 people × 750k	45,000,000
E1	Consultation-room tablets	22 units × 3M	66,000,000
E2	Mobile data packages	11 facilities × 12 months × 300k	39,600,000
F1	Independent review (2 rounds × 60 cases × 2 reviewers)	240 reviews × 150k	36,000,000
G1	Community pocketbook + education materials (3 languages)	1 package	20,000,000
G2	Kader training + community education sessions	10 sessions × 1M	10,000,000
H1	Medical-record review (months 0, 6, 12)	3 rounds × 8M	24,000,000
H2	Confidential patient survey	2 rounds × 10M	20,000,000
H3	Part-time data analyst	12 months × 2M	24,000,000
I1	Community recognition + dictionary publication	1 package	25,000,000
J	Contingency (~4.6%)	—	32,400,000
TOTAL			**700,000,000**

M = million IDR; k = thousand IDR. Recurring cost after year 1 (≈ IDR 71.6 million/year): server IDR 12M + data packages IDR 39.6M + dictionary updates ≈ IDR 20M. Yearly pocketbook updates are not yet costed.

Appendix B: Monitoring & evaluation matrix

No	Type	Indicator (numerator / denominator)	Baseline	Month 6	Month 12	Source	Frequency	Owner
1	Input	Facilities with active tablets / 11	0	5/11	11/11	Inventory	Monthly	Dinkes
2	Input	Trained doctors / all doctors at implementing facilities	0	≥90%*	≥90%*	Attendance list	Per training	Dinkes
3	Process	Visits with Tanya Jamu completed / Rx visits	0	≥70%*	≥90%*	System log	Monthly	Puskesmas head
4	Process	Product names matched in dictionary / all names reported	Months 1–2	≥80%*	≥90%*	System log	Monthly	Academics
5	Process	Median days until a new name is curated	—	≤7 days*	≤7 days*	Queue log	Monthly	Academics
6	Output	High alerts with recorded action / all high alerts	—	≥90%*	≥90%*	System log	Monthly	Committee
7	Outcome	Jamu status documented / adult Rx visits (sample of 400)	21%	≥60%	≥85%	Record review	Months 0, 6, 12	Analyst
8	Outcome	Local jamu flagged / local jamu needing review	40%	≥65%	≥75%	Independent review	Months 6, 12	Reviewers
9	Outcome	Standard products flagged / those needing review	72%	≥72%	≥72%	Independent review	Months 6, 12	Reviewers
10	Fairness	Indicator 9 − indicator 8	32 pts	≤10	≤5	Derived	Quarterly	Committee

Appendix B: Monitoring & evaluation matrix

No	Type	Indicator (numerator / denominator)	Baseline	Month 6	Month 12	Source	Frequency	Owner
11	Fairness	Documentation gap: remote facilities vs average	Month 1	⩽15 pts*	⩽10 pts*	Record review	Months 0, 6, 12	Analyst
12	Outcome	Jamu + Rx users assessed for safety / all jamu + Rx users	Month 1	⩾40%*	⩾70%*	Record review	Months 0, 6, 12	Analyst
13	Outcome	Patients reporting doctor knows jamu contents / herbal users	43%	–	⩾70%*	Confidential survey	Months 0, 12	Analyst
14	Safety	Unadvised medication stops / patients with an alert	Month 1	<5%*	<5%*	Follow-up / phone	Monthly	Doctor
15	Safety	Alerts per 100 visits; share of high alerts overridden	–	Monitored	Monitored	System log	Monthly	Committee
16	Safety	Median consultation duration	Month 1	Monitored	Monitored	Observation	Quarterly	Analyst
17	Partnership	MoU signed within 8 weeks (yes/no)	Not yet	Yes	–	Document	Once	Dinkes
18	Partnership	Satisfied practitioners / contributing practitioners	–	–	⩾70%*	Survey	Month 12	Academics
19	Sustainability	Permanent decree + APBD proposal (yes/no)	No	–	Yes	Document	Month 12	Dinkes
20	Impact	Reports of harmful herb-drug interactions	Monitored	Monitored	Not targeted	AE reports	Quarterly	Committee
21	Output	Kader trained / kader targeted	0	Monitored	Monitored	Training log	Quarterly	Dinkes
22	Output	Community education sessions held	0	Monitored	Monitored	Activity log	Quarterly	Dinkes
23	Output	Pocketbook published + yearly update planned (yes/no)	No	–	Yes	Document	Month 12	Academics

* Team-proposed target (not derived from the case data). Rx = prescription; AE = adverse event.
Method: pre-post design; independent validation of 60 cases per round; all results reported with 95% CIs.

Appendix C: Jamu Producer Data Collection Form

1. Practice & Consent [Goal 2]

Question — "Do you regularly produce or prepare jamu to share or sell in this area?"

Answer
- □ Yes (continue to no. 2)
- □ No (form ends; status "Not an active producer")
- □ Inactive / Seasonal

Consent for knowledge repository
- □ Consents, with benefit-sharing recognition
- □ Declines to share details

2. Remedy details (more than one allowed)

Local name	Remedy / product name, e.g. Kunyit Asam Segar, Jamu Pegal Linu Racikan
Form	□ Infusion/decoction □ Powder □ Dried cuttings □ Other
Herb source	□ Home garden □ Local market □ Outside collector/supplier
Main ingredients	Medicinal plants used, e.g. temulawak rhizome, red ginger, betel leaf
Health claims	Traditional use, e.g. menstrual pain relief, stomach, stamina
Preparation	□ Boiled □ Pressed raw □ Pounded / steeped
Distribution	□ Daily jamu gendong □ Home orders □ Small shops

Questionnaire design[24]

Appendix C: Jamu Producer Data Collection Form

3 · Sample / Herb photo

Question "May we take a photo of the dried herbs or raw materials, or of the finished remedy?"

Answer

- □ Yes (consents; photo used only for botanical validation & the local dictionary)
- □ Does not consent
- □ Not available / out of stock

4 · System curation & mapping (automatic)

Dictionary match

- □ Verified (RISTOJA/MPNS)
- □ Partial match
- □ New entry (sent to local curator queue)

Safety profile

- □ High-risk interaction herbs
- □ Moderate caution
- □ Safe / food-grade
- □ Unclassified

Screening flag

- □ Potential synthetic drug risk (BKO warning)
- □ Safe traditional preparation

Appendix C: Jamu Producer Data Collection Form

Follow-up Actions by Kader

Actions

- □ Registered to District Herbal Formulary
- □ Scheduled for hygiene & safe-preparation training by Puskesmas sanitarian
- □ Connected to Pharmacist Hub for chemical-interaction analysis
- □ Producer given safe-labelling guidelines

Producer feedback

- □ Welcomes clinic collaboration
- □ Sceptical / hesitant

Follow-up date [____ / ____ / 2026]

6 · Final status

Producer status Registered informal producer / Registered home industry / Unregistered

Remedy curation Curated in dictionary / Pending botanical verification

Appendix C: Tanya Jamu form – patient input

0 · Visit details (automatic)

Visit ID / medical-record no., date, facility, doctor, online/offline mode

1 · Jamu use in the last 30 days

"In the last 30 days, have you taken any jamu, herbal remedy, herbal or natural product?"
☐ Yes ☐ No (form ends; status "Does not use") ☐ Don't know

2 · Product details (more than one allowed)

Product name (in the patient's words)
Form: ☐ Infusion ☐ Capsule/tablet ☐ Powder ☐ Liquid ☐ Other
Source: ☐ Home-made ☐ Family ☐ Practitioner ☐ Shop ☐ Online
Ingredients known to the patient · Reason for use · Frequency and since when · BPOM registration number (if on the packaging)

3 · Packaging photo

"May I take a photo of the packaging or the remedy?"
☐ Yes (patient consents; photo used only for care) ☐ Does not consent
☐ Not brought

4 · System result (automatic)

Dictionary match: ☐ Match ☐ Partial ☐ No match (sent to curation queue)
Alert: ☐ High ☐ Medium ☐ Low ☐ None
Explanation of the interaction
Fixed on-screen note: screening results support decisions; they are not final conclusions

5 · Doctor's action (mandatory for high alerts)

☐ Prescription unchanged + monitoring ☐ Dose adjusted ☐ Drug switched ☐ Dosing times spaced apart ☐ Jamu paused ☐ Referred ☐ Education given
Reason for the decision
Patient agreement: ☐ Agrees ☐ Declines
☐ Message delivered: "Do not stop your medicines without talking to your doctor"
Follow-up date

6 · Final status (automatic; written to the medical record)

Jamu status: Uses / Does not use / Unknown
Safety assessment: Done / Not done
Both statuses feed indicators 7 and 12 in Appendix B

Recall period adapted from the 4-week recall used in Indonesia's national population survey; all other items are the team's draft.

Appendix D: DIJAMU Dictionary – data structure

Field	Content
Entry ID	Unique code
Local name + spelling variants	Example: the different names used for a single remedy
Community / language	Sundanese / Javanese / Chinese-Indonesian / other
Remedy form	Infusion, powder, capsule, etc.
Ingredients (local names)	List of ingredients
Scientific name + plant part	Matched to MPNS[7]
Verification status	From RISTOJA / curated / identity-tested
Interaction data	Drug or drug class, alert level, reference source[4,6]
Contributor	Practitioner's name (with consent)
Last updated	Automatic

Full risk register

Risk	Likelihood/Impact	Prevention	Contingency plan	Owner
Name mismatch	Medium / High	Double curation + identity testing	Correct dictionary + re-review affected cases	Academics
Doctor time burden	Medium / Medium	3 questions; form auto-filled	Nurses help with photos and recording	Puskesmas head
Alert fatigue	Medium / Medium	Tiered alerts	Committee reviews alert thresholds	Committee
Unadvised medication stops	Low / High	Education + mandatory message	Phone follow-up	Doctor
Practitioners decline to share	Medium / High	Benefit-sharing from the start	Build dictionary from RISTOJA + MPNS	Dinkes
Malaysian partner withdraws	Medium / Medium	Clear MoU	Continue with national sources	Dinkes
Signal disruption	High / Low	Offline mode	Paper form + later data entry	Puskesmas
Data breach	Low / High	Local server, restricted access	Incident procedure under the PDP Law[16]	Dinkes
Kader overload / turnover	Medium / Medium	Short guide; manageable caseload	Refresher training; recruit replacement kader	Puskesmas head
Producers withhold recipes	Medium / Medium	Persuasive approach; recognition	Use user-reported ingredients; identity testing	Academics
Pocketbook misread	Low / Medium	Evidence only; academic review	Correct, reissue, clarify in sessions	Academics

APPENDIX E

Link Video:

https://drive.google.com/drive/folders/19gQLJnDCtkmZ5tUdLnWebMVbTyDdAwwl