APPENDIX FIGURE S1: RESEARCH QUESTIONNAIRE AND DEMOGRAPHIC INFORMATION FORM (ROUND 1)

DEMOGRAPHIC INFORMATION

Please provide some information which is crucial for data synthesis:

1. Current Position:

[ ] Board of Directors
[ ] Head/Deputy Head of Department (or equivalent)
[ ] Staff
[ ] Other: _____

2. Highest Professional Qualification:

[ ] PhD or Specialist Level 2
[ ] Master or Specialist Level 1
[ ] Bachelor
[ ] Other: _____

3. Field of Work (Current or Past):

[ ] Hospital
[ ] Enterprise/Supplier
[ ] Teaching/Academic
[ ] Social Security / Health Insurance
[ ] Finance

4. Years of Experience related to Drug Supply:

[ ] Under 05 years
[ ] From 05 to 10 years
[ ] From 10 to 20 years
[ ] Over 20 years

APPENDIX S1: INDICATOR SET FOR EVALUATING THE ADAPTABILITY OF HOSPITAL DRUG FORMULARIES TO DISEASE PATTERNS
(EXPERT CONSULTATION – ROUND 1)
EVALUATION INSTRUCTIONS

Experts are requested to evaluate by circling or marking (X) in the box corresponding to your opinion (Score) for each Indicator. The scale ranges from 1 to 5:

- 1 point (Strongly Disagree): Certain that there is no relevance between the Indicator and the Criterion.
- 2 points (Disagree): Feel there is no relevance between the Indicator and the Criterion.
- 3 points (Neutral): Feel uncertain or lack sufficient information to evaluate the relevance.
- 4 points (Agree): Feel the relevance between the Indicator and the Criterion is correct or accurate.
- 5 points (Strongly Agree): Feel the relevance between the Indicator and the Criterion is completely correct or accurate.

If there are Indicators or Criteria proposed by the Research Team that need clarification or supplementation, please note them in the section below. If we have omitted any important Criteria/Indicators, we look forward to your additions.

PART 1. INPUT INDICATORS

I.1. Criterion: Adaptive Workforce (Staffing)

- **Hypothesis:** Developing the Hospital Drug Formulary (HDF) is teamwork. Efficiency depends on teamwork skills and the qualifications/experience of each member.
- **Significance:** Evaluates the hospital's readiness in terms of human resources for annual formulary development.

Code	Indicator	Expert Opinion (1-5)
I.1.1	HDF development is performed by 01 dedicated Pharmacist.	[1] [2] [3] [4] [5]
I.1.2	HDF development is performed by a group of Pharmacists at the Pharmacy Department.	[1] [2] [3] [4] [5]
I.1.3	HDF development is performed by the Formulary Subcommittee of the Pharmacy and Therapeutics Committee (PTC).	[1] [2] [3] [4] [5]
I.1.4	Annually, the workforce for HDF development is consolidated, supplemented, and operates on a concurrent/part-time basis.	[1] [2] [3] [4] [5]
I.1.5	The hospital assigns a specialized team for HDF development, where each member has specific duties.	[1] [2] [3] [4] [5]
I.1.6	Members of the specialized team are trained and rotated to perform multiple tasks and replace each other when necessary.	[1] [2] [3] [4] [5]
I.1.7	Personnel for the specialized team can be supplemented from outside the group according to the hospital's training plan.	[1] [2] [3] [4] [5]

Expert comments/additions for this section:

I.2. Criterion: Ensuring Drug Availability Requirements (National Essential Medicines List)

- **Hypothesis:** The National Essential Medicines List (EML) is the basis for selecting the most important technical standards when building the Hospital Principal Formulary.

Code	Indicator	Expert Opinion (1-5)
I.2.1	The Hospital Formulary includes full pharmacological groups as prescribed by the technical level regulations in the National EML.	[1] [2] [3] [4] [5]
I.2.2	The Hospital Formulary has more than one (>01) option regarding dosage form for an active ingredient or a therapeutic alternative.	[1] [2] [3] [4] [5]
I.2.3	The hospital determines the *Minimum Active Ingredient Ratio* required by the EML for the hospital level when building the Formulary.	[1] [2] [3] [4] [5]
I.2.4	The hospital determines the *Generic Group / Total Drug Demand Ratio* when building the Formulary.	[1] [2] [3] [4] [5]
I.2.5	The hospital determines the *Domestically Produced Drug / Generic Drug Demand Ratio* when building the Formulary.	[1] [2] [3] [4] [5]
I.2.6	The hospital determines the *Bioequivalent Drug / Domestically Produced Drug Demand Ratio* when building the Formulary.	[1] [2] [3] [4] [5]

Expert comments/additions for this section:

I.3. Criterion: Methods for Drug Needs Assessment

- **Hypothesis:** The effectiveness of determining drug needs depends on the method used. Combining multiple methods yields optimal results.

Code	Indicator	Expert Opinion (1-5)
I.3.1	The hospital determines drug needs based on usage statistics from the immediately preceding period (historical data).	[1] [2] [3] [4] [5]
I.3.2	The hospital determines drug needs based on historical usage data combined with essential medicine analysis (ABC/VEN analysis).	[1] [2] [3] [4] [5]
I.3.3	The hospital determines drug needs considering new technical developments and projected fluctuations in the patient population (Theoretical Demand).	[1] [2] [3] [4] [5]
I.3.4	The hospital determines drug needs considering professional capacity, number of doctors, and diagnosis/treatment guidelines.	[1] [2] [3] [4] [5]
I.3.5	The hospital determines drug needs considering the rate and frequency of medical examinations (Actual Demand).	[1] [2] [3] [4] [5]
I.3.6	The hospital determines drug needs considering storage capacity.	[1] [2] [3] [4] [5]
I.3.7	The hospital determines drug needs by balancing quantities with cost limits to ensure financial planning.	[1] [2] [3] [4] [5]
I.3.8	The hospital develops a general calculation formula for determining drug needs.	[1] [2] [3] [4] [5]
I.3.9	The hospital forecasts drug needs based on trend analysis and potential disease patterns in the near future.	[1] [2] [3] [4] [5]
I.3.10	The hospital uses commercially available software to determine needs for each drug type/group.	[1] [2] [3] [4] [5]
I.3.11	The hospital builds its own proprietary software to determine needs for each drug type/group.	[1] [2] [3] [4] [5]
I.3.12	When adjusting drug needs, the hospital follows expert opinion.	[1] [2] [3] [4] [5]
I.3.13	When adjusting drug needs, the hospital relies on cost-effectiveness analysis results.	[1] [2] [3] [4] [5]

Expert comments/additions for this section:

PART 2. PROCESS INDICATORS

P.1. Criterion: Ensuring Legal Compliance

- **Hypothesis:** Proactivity and flexibility within the legal framework ensure drug availability.

Code	Indicator	Expert Opinion (1-5)
P.1.1	Depending on the time, the hospital has a specialized team to update legal documents related to the Formulary.	[1] [2] [3] [4] [5]
P.1.2	The hospital develops, issues, and organizes implementation according to procedures for each specific HDF.	[1] [2] [3] [4] [5]
P.1.3	The hospital implements the full Formulary system as prescribed, including: Principal Formulary, Planned Formulary, Tender Formulary.	[1] [2] [3] [4] [5]
P.1.4	When signing contracts with winning bidders, the hospital calculates options to purchase additional quantities.	[1] [2] [3] [4] [5]
P.1.5	The hospital issues a Formulary covered by Health Insurance.	[1] [2] [3] [4] [5]
P.1.6	The hospital issues guidelines, organizes training, and updates on Formulary usage.	[1] [2] [3] [4] [5]
P.1.7	The Formulary is adjusted/supplemented upon request or proposal from Clinical Departments.	[1] [2] [3] [4] [5]
P.1.8	The Formulary is adjusted/supplemented based on the annual periodic evaluation by the Pharmacy and Therapeutics Committee.	[1] [2] [3] [4] [5]
P.1.9	Drug needs arising outside the Formulary must be analyzed and evaluated by the Pharmacy and Therapeutics Committee when actual demand occurs.	[1] [2] [3] [4] [5]

Expert comments/additions for this section:

P.2. Criterion: Appropriate Procurement (Ordering)

- **Hypothesis:** Efficient ordering depends on quantity, frequency, and timing.

Code	Indicator	Expert Opinion (1-5)
P.2.1	The hospital builds the drug purchase plan based on tender results.	[1] [2] [3] [4] [5]
P.2.2	The hospital determines the buffer stock quantity in the purchase plan for the transition period between old and new tender results.	[1] [2] [3] [4] [5]
P.2.3	The hospital purchases the first order under the new tender result by taking the average of the planned quantity (Exploratory Strategy).	[1] [2] [3] [4] [5]
P.2.4	The first order under the tender result integrates inventory quantity and warehouse storage volume.	[1] [2] [3] [4] [5]
P.2.5	The hospital performs ordering according to a fixed schedule.	[1] [2] [3] [4] [5]
P.2.6	The hospital places orders based on the consumption rate of each item when the quantity reaches the minimum stock threshold.	[1] [2] [3] [4] [5]
P.2.7	The hospital integrates ordering with tracking quantities according to the purchase contract.	[1] [2] [3] [4] [5]
P.2.8	The hospital performs order quantity estimation using software.	[1] [2] [3] [4] [5]
P.2.9	The hospital uses software to predict ordering timing.	[1] [2] [3] [4] [5]

Expert comments/additions for this section:

P.3. Criterion: Usage Adaptation

- **Hypothesis:** Accurate prescribing and dispensing correlate with quality of care and patient satisfaction.

Code	Indicator	Expert Opinion (1-5)
P.3.1	The hospital implements a secondary inventory management system (Central Warehouse – Satellite/Ward Stock) for each patient group.	[1] [2] [3] [4] [5]
P.3.2	The hospital ensures the prescribing system is always available with quantities and unit prices for doctors to select when prescribing.	[1] [2] [3] [4] [5]
P.3.3	After tender results are released, the hospital organizes training and informs physicians/staff about the new drug formulary.	[1] [2] [3] [4] [5]
P.3.4	When there is a new drug formulary, the hospital updates supplements and changes notes/warnings regarding: consultation drugs; look-alike/sound-alike drugs; Health Insurance requirements.	[1] [2] [3] [4] [5]
P.3.5	The hospital has tools to control notes/recommendations on drug use in the new formulary.	[1] [2] [3] [4] [5]
P.3.6	Drug use information is written fully and clearly on the prescription to facilitate patient use.	[1] [2] [3] [4] [5]
P.3.7	The Pharmacy Department ensures the correct and sufficient drugs according to the prescription when dispensing to patients.	[1] [2] [3] [4] [5]
P.3.8	Pharmacists provide drug use instructions to patients upon request.	[1] [2] [3] [4] [5]
P.3.9	The Pharmacy Department has a specialized unit for drug information and guidance for patients and medical staff.	[1] [2] [3] [4] [5]
P.3.10	The hospital uses IT to provide timely drug information to physicians during prescribing.	[1] [2] [3] [4] [5]
P.3.11	The hospital uses Prescribing Software integrated with drug cost limit warnings for doctors.	[1] [2] [3] [4] [5]
P.3.12	The hospital uses Prescribing Software integrated with Drug Interaction Warnings for doctors.	[1] [2] [3] [4] [5]
P.3.13	The hospital designs channels to receive drug information from doctors and medical staff accurately and timely.	[1] [2] [3] [4] [5]

Expert comments/additions for this section:

P.4. Criterion: Storage Adaptation

- **Hypothesis:** Proper storage and dispensing increase service quality.

Code	Indicator	Expert Opinion (1-5)
P.4.1	Drugs are arranged based on special regulations: narcotics, psychotropics; temperature-controlled drugs.	[1] [2] [3] [4] [5]
P.4.2	The pharmacy warehouse has sufficient equipment to adjust temperature and humidity.	[1] [2] [3] [4] [5]
P.4.3	The pharmacy warehouse has a quarantine area for substandard drugs.	[1] [2] [3] [4] [5]
P.4.4	The pharmacy warehouse has a temperature/humidity monitoring system updated manually.	[1] [2] [3] [4] [5]
P.4.5	The pharmacy warehouse has a temperature/humidity monitoring system updated automatically.	[1] [2] [3] [4] [5]
P.4.6	Drugs in the warehouse are arranged by pharmacological group.	[1] [2] [3] [4] [5]
P.4.7	Drugs in the warehouse are arranged in alphabetical order.	[1] [2] [3] [4] [5]
P.4.8	Drugs in the warehouse are arranged according to ABC/VEN analysis results.	[1] [2] [3] [4] [5]
P.4.9	The pharmacy warehouse has software to track input-output-inventory for each drug item.	[1] [2] [3] [4] [5]
P.4.10	The warehouse management software integrates tracking of tender data.	[1] [2] [3] [4] [5]
P.4.11	Drug items in the warehouse are coded on packaging and in the system.	[1] [2] [3] [4] [5]

Expert comments/additions for this section:

P.5. Criterion: Risk Management

- **Hypothesis:** Adaptability efficiency depends on strategies for stock-keeping and drug transfer to minimize waste and shortages.

Code	Indicator	Expert Opinion (1-5)
P.5.1	The hospital builds a centralized storage and preservation system.	[1] [2] [3] [4] [5]
P.5.2	The hospital has a secondary storage system for each patient category.	[1] [2] [3] [4] [5]
P.5.3	The hospital has a formula to determine general inventory levels for the entire formulary.	[1] [2] [3] [4] [5]
P.5.4	The hospital has a formula to determine minimum/maximum stock levels for each drug type.	[1] [2] [3] [4] [5]
P.5.5	The hospital has a system to monitor quantity and quality of drugs at Ward Cabinets.	[1] [2] [3] [4] [5]
P.5.6	Monitoring of drugs at Ward Cabinets is done via a common software system.	[1] [2] [3] [4] [5]
P.5.7	Information on drugs in Ward Cabinets is public, updated, and accessible to on-duty doctors hospital-wide.	[1] [2] [3] [4] [5]
P.5.8	The hospital develops scenarios to activate "option to purchase additional quantities" in contracts.	[1] [2] [3] [4] [5]
P.5.9	The hospital develops scenarios for supplementary drug purchasing when needed.	[1] [2] [3] [4] [5]
P.5.10	Statistical data can timely track drugs with no/low demand, risk of excess, dead stock, and expiration.	[1] [2] [3] [4] [5]
P.5.11	The Pharmacy Department timely notifies prescribing doctors about drugs at risk of waste.	[1] [2] [3] [4] [5]
P.5.12	The Pharmacy Department can perform transfers between drugs at risk of waste that have multiple dosage forms.	[1] [2] [3] [4] [5]
P.5.13	The Pharmacy Department can perform transfers between drugs at risk of waste that have the same pharmacological effect.	[1] [2] [3] [4] [5]
P.5.14	The Pharmacy Department performs drug transfers between Clinical Departments within the hospital.	[1] [2] [3] [4] [5]
P.5.15	The hospital performs drug transfers with external medical facilities.	[1] [2] [3] [4] [5]

Expert comments/additions for this section:

PART 3. OUTPUT AND OUTCOME INDICATORS

Code	Indicator	Significance & Formula	Expert Opinion (1-5)
O.1	**Percentage of single-ingredient drugs**	*Significance:* Evaluates prioritization of single-ingredient drugs. *Formula:* (Quantity of single-ingredient drugs / Total drug items in Formulary) x 100%	[1] [2] [3] [4] [5]
O.2	**Percentage of essential medicines**	*Significance:* Evaluates availability of essential medicines (Target >80%). *Formula:* (Number of essential active ingredients / Total active ingredients) x 100%	[1] [2] [3] [4] [5]
O.3	**Percentage of domestically produced drugs**	*Significance:* Evaluates availability of domestic generic drugs (Strategy target: 80%). *Formula:* (Number of domestic drugs / Total generic drugs) x 100%	[1] [2] [3] [4] [5]
O.4	**Percentage of cost for domestically produced drugs**	*Significance:* Evaluates financial efficiency (Strategy target: 70%). *Formula:* (Value of domestic drugs / Total value of generic drugs) x 100%	[1] [2] [3] [4] [5]
O.5	**Percentage of bioequivalent drugs**	*Significance:* Evaluates ratio of drugs proven bioequivalent (Strategy target: 30%). *Formula:* (Quantity of bioequivalent drugs / Total generic drugs) x 100%	[1] [2] [3] [4] [5]
O.6	**Percentage of drugs with actual usage demand**	*Significance:* Reflects actual disease patterns via statistics. *Formula:* (Number of prescribed drugs / Total drug items) x 100%	[1] [2] [3] [4] [5]
O.7	**Percentage of temporary stock-outs**	*Significance:* Tracks frequency of short-term unavailability. *Formula:* (Number of temporary stock-out instances / Total drug items) x 100%	[1] [2] [3] [4] [5]

Code	Indicator	Significance & Formula	Expert Opinion (1-5)
O.8	**Percentage of shortages requiring alternative plans**	*Significance:* Evaluates essential drugs that cannot be supplied requiring substitution. *Formula:* (Quantity of drugs requiring alternatives / Total drug quantity) x 100%	[1] [2] [3] [4] [5]
O.9	**Percentage of drugs requiring disposal/liquidation**	*Significance:* Evaluates waste risk. *Formula:* (Quantity of drugs for disposal / Total drug items) x 100%	[1] [2] [3] [4] [5]
O.10	**Percentage of value of drugs requiring disposal**	*Significance:* Reflects financial waste. *Formula:* (Value of drugs for disposal / Total value used in year) x 100%	[1] [2] [3] [4] [5]
O.11	**Percentage of items with "Option to purchase additional quantities"**	*Significance:* Evaluates contingency planning. *Formula:* (Number of drugs with additional purchase option / Total drug items) x 100%	[1] [2] [3] [4] [5]
O.12	**Percentage of non-activated additional purchase options**	*Significance:* Evaluates accuracy of contingency planning. *Formula:* (Number of non-activated options / Total drugs with options) x 100%	[1] [2] [3] [4] [5]
O.13	**Percentage of supplementary purchases**	*Significance:* Evaluates prediction accuracy when supplementary purchases are needed. *Formula:* (Quantity of supplementary purchases / Total drug items) x 100%	[1] [2] [3] [4] [5]
O.14	**Percentage of drugs not meeting minimum contract ratio**	*Significance:* Evaluates prediction accuracy regarding minimum contract commitment (70%). *Formula:* (Total drugs not meeting min ratio / Total drug items) x 100%	[1] [2] [3] [4] [5]
O.15	**Ordering Frequency**	*Significance:* Number of orders per year. Reflects actual demand vs. plan. *Formula:* N/A	[1] [2] [3] [4] [5]

Code	Indicator	Significance & Formula	Expert Opinion (1-5)
O.16	**Percentage of drugs requiring adjustment/transfer**	*Significance:* Reflects risk of excess causing financial waste. *Formula:* (Number of transferred drugs / Total drug items) x 100%	[1] [2] [3] [4] [5]

Expert comments/additions for this section:

APPENDIX S2: INDICATOR SET FOR EVALUATING THE ADAPTABILITY OF HOSPITAL DRUG FORMULARIES TO DISEASE PATTERNS

Dear valued Experts,

The Research Team would like to express our deepest gratitude and appreciation for the time, intellect, enthusiasm, and experience you have dedicated to contributing to and building the **"Indicator Set for Evaluating the Adaptability of Hospital Drug Formularies to Disease Patterns."**

To ensure scientific rigor, the Research Team kindly requests that you express your views on the Criteria and Indicators one more time.

In this Round 2, Experts are invited to confirm or modify their opinions based on additional data regarding the mean scores of each indicator, which have been synthesized from Round 1 feedback from 50 Experts nationwide across 05 sectors related to hospital drug supply, including: Drug Regulatory Authorities; Hospitals (Doctors, Pharmacists, Nurses); Non-clinical Service Providers (Suppliers); Social Security – Health Insurance; and University Lecturers in Pharmacy.

Simultaneously, Round 2 also seeks Expert opinion on 04 supplementary indicators proposed by other Experts (at the end of the form) and on the importance level of potential risks encountered during the implementation of the Drug Formulary.

Instructions: Please evaluate by circling or marking (X) in the box corresponding to your opinion (Score) for each Indicator. The scale ranges from 1 to 5, corresponding to the level of agreement regarding the relevance of the proposed Indicator in reflecting the Criteria:

- 1 point (Strongly Disagree): Certain that there is no relevance between the Indicator and the Criterion.
- 2 points (Disagree): Feel there is no relevance between the Indicator and the Criterion.
- 3 points (Neutral): Feel uncertain or lack sufficient information about the relevance.
- 4 points (Agree): Feel the relevance between the Indicator and the Criterion is correct or accurate.
- 5 points (Strongly Agree): Feel the relevance between the Indicator and the Criterion is completely correct or accurate.

Feedback contact: Email: chucmaihien@gmail.com | Phone +84989.615461

We sincerely thank you and wish you good health and success!

PART 1. INPUT INDICATORS

I.1. Criterion: Adaptive Workforce (Staffing)

- **Hypothesis:** Developing the Hospital Drug Formulary (HDF) is teamwork. Efficiency depends on teamwork skills and the qualifications/experience of each member.
- **Significance:** Evaluates the hospital's readiness in terms of human resources for annual formulary development.

Code	Indicator	Round 1 Mean	Expert Opinion (Round 2) (1: Strongly Disagree - 5: Strongly Agree)
I.1.1	HDF development is performed by 01 dedicated Pharmacist.	2.12	[1] [2] [3] [4] [5]
I.1.2	HDF development is performed by a group of Pharmacists at the Pharmacy Department.	3.12	[1] [2] [3] [4] [5]
I.1.3	HDF development is performed by the Formulary Subcommittee of the Pharmacy and Therapeutics Committee (PTC).	4.52	[1] [2] [3] [4] [5]
I.1.4	Annually, the workforce for HDF development is consolidated, supplemented, and operates on a concurrent/part-time basis.	4.04	[1] [2] [3] [4] [5]
I.1.5	The hospital assigns a specialized team for HDF development, where each member has specific duties.	4.24	[1] [2] [3] [4] [5]
I.1.6	Members of the specialized team are trained and rotated to perform multiple tasks and replace each other when necessary.	4.34	[1] [2] [3] [4] [5]
I.1.7	Personnel for the specialized team can be supplemented from outside the group according to the hospital's training plan.	4.04	[1] [2] [3] [4] [5]

I.2. Criterion: Ensuring Drug Availability Requirements (National Essential Medicines List)

- **Hypothesis:** The National Essential Medicines List (EML) is the basis for selecting the most important technical standards when building the Hospital Formulary.

Code	Indicator	Round 1 Mean	Expert Opinion (Round 2) (1: Strongly Disagree - 5: Strongly Agree)
I.2.1	The Hospital Formulary includes full pharmacological groups as prescribed by the technical level regulations in the National EML.	4.10	[1] [2] [3] [4] [5]
I.2.2	The Hospital Formulary has more than one (>01) option regarding dosage form for an active ingredient or a therapeutic alternative.	4.08	[1] [2] [3] [4] [5]
I.2.3	The hospital determines the *Minimum Active Ingredient Ratio* required by the EML for the hospital level when building the Formulary.	3.88	[1] [2] [3] [4] [5]
I.2.4	The hospital determines the *Generic Group / Total Drug Demand Ratio* when building the Formulary.	4.12	[1] [2] [3] [4] [5]
I.2.5	The hospital determines the *Domestically Produced Drug / Generic Drug Demand Ratio* when building the Formulary.	4.02	[1] [2] [3] [4] [5]
I.2.6	The hospital determines the *Bioequivalent Drug / Domestically Produced Drug Demand Ratio* when building the Formulary.	3.90	[1] [2] [3] [4] [5]

I.3. Criterion: Methods for Drug Needs Assessment

- **Hypothesis:** The effectiveness of determining drug needs (Expected Disease Pattern) depends on the method used for each drug/drug group; there is no single method for all. Combining multiple methods yields optimal results.

Code	Indicator	Round 1 Mean	Expert Opinion (Round 2) (1: Strongly Disagree - 5: Strongly Agree)
I.3.1	The hospital determines drug needs based on usage statistics from the immediately preceding period (historical data).	4.04	[1] [2] [3] [4] [5]
I.3.2	The hospital determines drug needs based on historical usage data combined with essential medicine analysis (ABC/VEN analysis).	4.32	[1] [2] [3] [4] [5]
I.3.3	The hospital determines drug needs considering new technical developments and projected fluctuations (increase/decrease) in the patient population (Theoretical Demand).	4.34	[1] [2] [3] [4] [5]
I.3.4	The hospital determines drug needs considering professional capacity, number of doctors, and diagnosis/treatment guidelines.	4.06	[1] [2] [3] [4] [5]
I.3.5	The hospital determines drug needs considering the rate and frequency of medical examinations (Actual Demand).	4.22	[1] [2] [3] [4] [5]
I.3.6	The hospital determines drug needs considering storage capacity.	4.08	[1] [2] [3] [4] [5]
I.3.7	The hospital determines drug needs by balancing quantities with cost limits to ensure financial planning.	4.08	[1] [2] [3] [4] [5]
I.3.8	The hospital develops a general calculation formula for determining drug needs.	3.62	[1] [2] [3] [4] [5]
I.3.9	The hospital forecasts drug needs based on trend analysis and potential disease patterns in the near future.	4.00	[1] [2] [3] [4] [5]

Code	Indicator	Round 1 Mean	Expert Opinion (Round 2) (1: Strongly Disagree - 5: Strongly Agree)
I.3.10	The hospital uses commercially available software to determine needs for each drug type/group.	2.98	[1] [2] [3] [4] [5]
I.3.11	The hospital builds its own proprietary software to determine needs for each drug type/group.	3.56	[1] [2] [3] [4] [5]
I.3.12	When adjusting drug needs, the hospital follows expert opinion.	3.64	[1] [2] [3] [4] [5]
I.3.13	When adjusting drug needs, the hospital relies on cost-effectiveness analysis results.	4.16	[1] [2] [3] [4] [5]

PART 2. PROCESS INDICATORS

P.1. Criterion: Ensuring Legal Compliance

- **Hypothesis:** Being proactive and flexible within the legal framework ensures the goal of drug availability for treatment.

Code	Indicator	Round 1 Mean	Expert Opinion (Round 2) (1: Strongly Disagree - 5: Strongly Agree)
P.1.1	Depending on the time, the hospital has a specialized team to update legal documents related to the Formulary.	3.94	[1] [2] [3] [4] [5]
P.1.2	The hospital develops, issues, and organizes implementation according to procedures for each specific HDF.	4.00	[1] [2] [3] [4] [5]
P.1.3	The hospital implements the full Formulary system as prescribed, including: Principal Formulary, Planned Formulary, Tender Formulary.	4.06	[1] [2] [3] [4] [5]
P.1.4	When signing contracts with winning bidders, the hospital calculates options to purchase additional quantities.	3.68	[1] [2] [3] [4] [5]
P.1.5	The hospital issues a Formulary covered by Health Insurance.	4.14	[1] [2] [3] [4] [5]
P.1.6	The hospital issues guidelines, organizes training, and updates on Formulary usage.	4.30	[1] [2] [3] [4] [5]
P.1.7	The Formulary is adjusted/supplemented upon request or proposal from Clinical Departments.	4.16	[1] [2] [3] [4] [5]
P.1.8	The Formulary is adjusted/supplemented based on the annual periodic evaluation by the Pharmacy and Therapeutics Committee.	4.54	[1] [2] [3] [4] [5]
P.1.9	Drug needs arising outside the Formulary must be analyzed and evaluated by the Pharmacy and Therapeutics Committee when actual demand occurs.	4.60	[1] [2] [3] [4] [5]

P.2. Criterion: Appropriate Procurement (Ordering)

- **Hypothesis:** Ordering contributes to supply efficiency. The 03 most important factors are quantity, frequency, and timing.

Code	Indicator	Round 1 Mean	Expert Opinion (Round 2) (1: Strongly Disagree - 5: Strongly Agree)
P.2.1	The hospital builds the drug purchase plan based on tender results.	4.24	[1] [2] [3] [4] [5]
P.2.2	The hospital determines the buffer stock quantity in the purchase plan for the transition period between old and new tender results.	4.34	[1] [2] [3] [4] [5]
P.2.3	The hospital purchases the first order under the new tender result by taking the average of the planned quantity (Exploratory Strategy).	3.26	[1] [2] [3] [4] [5]
P.2.4	The first order under the tender result integrates inventory quantity and warehouse storage volume.	3.88	[1] [2] [3] [4] [5]
P.2.5	The hospital performs ordering according to a fixed schedule.	3.38	[1] [2] [3] [4] [5]
P.2.6	The hospital places orders based on the consumption rate of each item when the quantity reaches the minimum stock threshold.	4.10	[1] [2] [3] [4] [5]
P.2.7	The hospital integrates ordering with tracking quantities according to the purchase contract.	4.18	[1] [2] [3] [4] [5]
P.2.8	The hospital performs order quantity estimation using software.	4.04	[1] [2] [3] [4] [5]
P.2.9	The hospital uses software to predict ordering timing.	3.68	[1] [2] [3] [4] [5]

P.3. Criterion: Usage Adaptation

- **Hypothesis:** A system of accurate prescribing and dispensing (right drug, right patient, right way) reflects the adaptability of the HDF to disease patterns, correlating with quality of care and patient satisfaction.

Code	Indicator	Round 1 Mean	Expert Opinion (Round 2) (1: Strongly Disagree - 5: Strongly Agree)
P.3.1	The hospital implements a secondary inventory management system (Central Warehouse – Satellite/Ward Stock) for each patient group.	4.04	[1] [2] [3] [4] [5]
P.3.2	The hospital ensures the prescribing system is always available with quantities and unit prices for doctors to select when prescribing.	4.54	[1] [2] [3] [4] [5]
P.3.3	After tender results are released, the hospital organizes training and informs physicians/staff about the new drug formulary.	4.32	[1] [2] [3] [4] [5]
P.3.4	When there is a new drug formulary, the hospital updates supplements and changes notes/warnings regarding: consultation drugs; look-alike/sound-alike drugs; Health Insurance requirements for specific winning drugs.	4.62	[1] [2] [3] [4] [5]
P.3.5	The hospital has tools to control notes/recommendations on drug use in the new formulary.	4.44	[1] [2] [3] [4] [5]
P.3.6	Drug use information is written fully and clearly on the prescription to facilitate patient use.	4.54	[1] [2] [3] [4] [5]
P.3.7	The Pharmacy Department ensures the correct and sufficient drugs according to the prescription when dispensing to patients.	4.64	[1] [2] [3] [4] [5]
P.3.8	Pharmacists provide drug use instructions to patients upon request.	4.36	[1] [2] [3] [4] [5]
P.3.9	The Pharmacy Department has a specialized unit for drug information and guidance for patients and medical staff during treatment.	4.38	[1] [2] [3] [4] [5]

Code	Indicator	Round 1 Mean	Expert Opinion (Round 2) (1: Strongly Disagree - 5: Strongly Agree)
P.3.10	The hospital uses Information Technology (IT) to provide timely drug information to physicians during prescribing.	4.56	[1] [2] [3] [4] [5]
P.3.11	The hospital uses Prescribing Software integrated with drug cost limit warnings for doctors.	4.38	[1] [2] [3] [4] [5]
P.3.12	The hospital uses Prescribing Software integrated with Drug Interaction Warnings for doctors.	4.58	[1] [2] [3] [4] [5]
P.3.13	The hospital designs channels to receive drug information from doctors and medical staff accurately and timely.	4.40	[1] [2] [3] [4] [5]

P.4. Criterion: Storage Adaptation

- **Hypothesis:** Ensuring drug quality and precise, convenient dispensing processes increases service quality and patient satisfaction.

Code	Indicator	Round 1 Mean	Expert Opinion (Round 2) (1: Strongly Disagree - 5: Strongly Agree)
P.4.1	Drugs are arranged in the warehouse based on special regulations: narcotics, psychotropics; temperature-controlled drugs.	4.62	[1] [2] [3] [4] [5]
P.4.2	The pharmacy warehouse has sufficient equipment to adjust temperature and humidity for drug storage.	4.68	[1] [2] [3] [4] [5]
P.4.3	The pharmacy warehouse has a quarantine area for substandard drugs.	4.60	[1] [2] [3] [4] [5]
P.4.4	The pharmacy warehouse has a temperature/humidity monitoring system updated manually.	3.48	[1] [2] [3] [4] [5]
P.4.5	The pharmacy warehouse has a temperature/humidity monitoring system updated automatically.	4.54	[1] [2] [3] [4] [5]
P.4.6	Drugs in the warehouse are arranged by pharmacological group.	4.26	[1] [2] [3] [4] [5]
P.4.7	Drugs in the warehouse are arranged alphabetically.	3.50	[1] [2] [3] [4] [5]
P.4.8	Drugs in the warehouse are arranged according to ABC/VEN analysis results.	3.24	[1] [2] [3] [4] [5]
P.4.9	The pharmacy warehouse has software to track input-output-inventory for each drug item.	4.60	[1] [2] [3] [4] [5]
P.4.10	The warehouse management software integrates tracking of tender data.	4.32	[1] [2] [3] [4] [5]
P.4.11	Drug items in the warehouse are coded on packaging and in the system.	4.08	[1] [2] [3] [4] [5]

P.5. Criterion: Risk Management

- **Hypothesis:** Adaptability efficiency depends on the hospital's strategy in stock-keeping to reduce shortages and flexibility in transferring drugs to minimize waste (excess, failure to meet minimum contract commitment, expiration).

Code	Indicator	Round 1 Mean	Expert Opinion (Round 2) (1: Strongly Disagree - 5: Strongly Agree)
P.5.1	The hospital builds a centralized storage and preservation system.	4.26	[1] [2] [3] [4] [5]
P.5.2	The hospital has a secondary storage system for each patient category.	3.90	[1] [2] [3] [4] [5]
P.5.3	The hospital has a formula to determine general inventory levels for the entire formulary.	4.64	[1] [2] [3] [4] [5]
P.5.4	The hospital has a formula to determine minimum/maximum stock levels for each drug type.	4.22	[1] [2] [3] [4] [5]
P.5.5	The hospital has a system to monitor quantity and quality of drugs at Clinical Department Ward Cabinets.	4.30	[1] [2] [3] [4] [5]
P.5.6	Monitoring of drugs at Ward Cabinets is done via a common software system.	4.10	[1] [2] [3] [4] [5]
P.5.7	Information on quantity/quality of drugs in Ward Cabinets is public, updated, and easily accessible to on-duty doctors hospital-wide.	4.42	[1] [2] [3] [4] [5]
P.5.8	The hospital develops scenarios to activate "option to purchase additional quantities" in contracts.	3.94	[1] [2] [3] [4] [5]
P.5.9	The hospital develops scenarios for supplementary drug purchasing when needed.	4.24	[1] [2] [3] [4] [5]
P.5.10	Statistical data can timely track drugs with no demand, low demand, risk of excess, dead stock, and expiration.	4.30	[1] [2] [3] [4] [5]

Code	Indicator	Round 1 Mean	Expert Opinion (Round 2) (1: Strongly Disagree - 5: Strongly Agree)
P.5.11	The Pharmacy Department timely notifies prescribing doctors about drugs at risk of waste.	4.52	[1] [2] [3] [4] [5]
P.5.12	The Pharmacy Department can perform transfers between drugs at risk of waste that have multiple dosage forms.	4.02	[1] [2] [3] [4] [5]
P.5.13	The Pharmacy Department can perform transfers between drugs at risk of waste that have the same pharmacological effect.	4.16	[1] [2] [3] [4] [5]
P.5.14	The Pharmacy Department performs drug transfers between Clinical Departments within the hospital.	3.78	[1] [2] [3] [4] [5]
P.5.15	The hospital performs drug transfers with external medical facilities.	3.88	[1] [2] [3] [4] [5]

EXPERT EVALUATION ON RISK PRIORITIZATION

Please rate the following risks:

- 5 points: Very serious, must be prioritized for immediate resolution.
- 4 points: Serious, must be resolved.
- 3 points: Moderately serious, may need resolution but takes time.
- 2 points: Less serious, note for resolution when convenient.
- 1 point: Not serious.

No.	**Content**	**Expert Score (1-5)**
1	Human resources do not ensure professional capacity or sufficient quantity.	[ ]
2	Warehouse system does not ensure conditions to maintain quality and storage volume.	[ ]
3	Statistical software system does not meet management and prescribing requirements. Lack of integrated information for system-wide control.	[ ]
4	Failure to determine drug needs causes shortages.	[ ]
5	Irrational procurement causes excess drugs and expired drugs, leading to waste.	[ ]

PART 3. OUTPUT AND OUTCOME INDICATORS

Code	Indicator	Significance & Formula	Round 1 Mean	Expert Opinion (Round 2)
O.1	**Percentage of single-ingredient drugs**	*Significance:* Evaluates the prioritization of single-ingredient drugs; combination drugs used only when efficacy is proven superior. *Formula:* (Quantity of single-ingredient drugs / Total drug items in Formulary) x 100%	4.02	[1] [2] [3] [4] [5]
O.2	**Percentage of essential medicines**	*Significance:* Evaluates availability of essential medicines to increase patient access. Target: Minimum 80%. *Formula:* (Number of essential active ingredients / Total active ingredients) x 100%	4.06	[1] [2] [3] [4] [5]
O.3	**Percentage of domestically produced drugs**	*Significance:* Evaluates availability of domestic generic drugs (quality/cost). Strategy target: 80%. *Formula:* (Number of domestic drugs / Total generic drugs) x 100%	3.96	[1] [2] [3] [4] [5]
O.4	**Percentage of cost for domestically produced drugs**	*Significance:* Evaluates financial efficiency in generic drug use. Strategy target: 70%. *Formula:* (Value of domestic drugs / Total value of generic drugs) x 100%	3.78	[1] [2] [3] [4] [5]

Code	Indicator	Significance & Formula	Round 1 Mean	Expert Opinion (Round 2)
O.5	**Percentage of bioequivalent drugs**	*Significance:* Evaluates ratio of drugs proven bioequivalent (quality equivalent to innovator, lower cost). Strategy target: 30%. *Formula:* (Quantity of bioequivalent drugs / Total generic drugs) x 100%	3.74	[1] [2] [3] [4] [5]
O.6	**Percentage of drugs with actual usage demand**	*Significance:* Reflects actual disease patterns via prescribing statistics. Helps adjust needs for subsequent periods. *Formula:* (Number of prescribed drugs / Total drug items) x 100%	4.20	[1] [2] [3] [4] [5]
O.7	**Percentage of temporary stock-outs**	*Significance:* Tracks frequency of drug unavailability for any reason causing short-term delays (within the day). *Formula:* (Number of temporary stock-out instances / Total drug items) x 100%	3.80	[1] [2] [3] [4] [5]
O.8	**Percentage of shortages requiring alternative plans**	*Significance:* Evaluates essential drugs that cannot be supplied (no bidder, no supplier, breach of contract) requiring substitution. *Formula:* (Quantity of drugs requiring alternatives / Total drug quantity) x 100%	3.98	[1] [2] [3] [4] [5]

Code	Indicator	Significance & Formula	Round 1 Mean	Expert Opinion (Round 2)
O.9	**Percentage of drugs requiring disposal/liquidation**	*Significance:* Evaluates waste risk. *Formula:* (Quantity of drugs for disposal / Total drug items) x 100%	4.06	[1] [2] [3] [4] [5]
O.10	**Percentage of value of drugs requiring disposal**	*Significance:* Reflects financial waste (expired, poor quality). *Formula:* (Value of drugs for disposal / Total value used in year) x 100%	4.10	[1] [2] [3] [4] [5]
O.11	**Percentage of items with "Option to purchase additional quantities"**	*Significance:* Evaluates demand prediction capability and contingency planning. *Formula:* (Number of drugs with additional purchase option / Total drug items) x 100%	4.04	[1] [2] [3] [4] [5]
O.12	**Percentage of non-activated additional purchase options**	*Significance:* Evaluates accuracy of contingency planning in demand assessment. *Formula:* (Number of non-activated options / Total drugs with options) x 100%	3.82	[1] [2] [3] [4] [5]

Code	Indicator	Significance & Formula	Round 1 Mean	Expert Opinion (Round 2)
O.13	**Percentage of supplementary purchases**	*Significance:* Evaluates demand prediction when supplementary purchases are needed due to exceeding limits or new techniques. *Formula:* (Quantity of supplementary purchases / Total drug items) x 100%	4.10	[1] [2] [3] [4] [5]
O.14	**Percentage of drugs not meeting minimum contract ratio**	*Significance:* Evaluates prediction accuracy where forecast exceeds actual use, failing to meet minimum contract commitment (min 70%), causing supplier loss. *Formula:* (Total drugs not meeting min ratio / Total drug items) x 100%	3.92	[1] [2] [3] [4] [5]
O.15	**Ordering Frequency**	*Significance:* Number of orders per year. Reflects actual demand vs. plan based on inventory. *Formula:* N/A	4.04	[1] [2] [3] [4] [5]
O.16	**Percentage of drugs requiring adjustment/transfer**	*Significance:* Reflects risk of excess causing financial waste and lost treatment opportunities. *Formula:* (Number of transferred drugs / Total drug items) x 100%	4.06	[1] [2] [3] [4] [5]

SUPPLEMENTARY PROPOSALS

The following indicators were suggested by Experts. Please give your opinion:

Indicator	**Significance & Formula**	**Expert Opinion (Round 2)**
Availability of key medicines in stock	*Significance:* Reflects availability of active ingredients in the formulary at the time of assessment. Ideal is 100%. *Formula:* Number of active ingredients in stock / Total active ingredients in Formulary.	[1] [2] [3] [4] [5]
Access rate to the drug formulary by physicians	*Significance:* Full access (inpatient/outpatient) helps doctors make decisions and avoid errors (e.g., non-reimbursable drugs). *Formula:* Number of doctors with full access / Total number of doctors.	[1] [2] [3] [4] [5]
Average number of drugs per prescription	*Significance:* Measures the degree of polypharmacy. *Formula:* Total different drug products prescribed / Number of sampled encounters. (Fixed-dose combinations count as one).	[1] [2] [3] [4] [5]
Percentage of encounters with an antibiotic prescribed	*Significance:* Measures total antibiotic usage. *Formula:* (Number of patient encounters with antibiotic / Total encounters surveyed) x 100.	[1] [2] [3] [4] [5]