

Workshop Handout Materials

AI Agents Driving Gender Equity in Indian Women's Health

Mayo Summit / [Your Event]

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1. Workshop Overview & Learning Objectives

This hands-on workshop equips participants to build **gender-equity AI agents** that support India's ~1 million ASHA workers in addressing key women's health disparities.

Key NFHS-5 Statistics (2019-21):

- Anemia prevalence among women 15-49: **~57%** (higher in rural and SC/ST groups)
- Adolescent pregnancies and early marriages remain high in rural areas
- Spousal/domestic violence: **~29-30%** lifetime prevalence, with large screening gaps

Three AI Agents:

- 1. Anemia Agent** — Risk scoring using hemoglobin, menstrual history, diet, and socio-demographics.
- 2. Maternal Agent** — High-risk pregnancy screening (adolescent, rural, anemia-linked).

3. Safety Agent — Domestic violence risk flags based on household, migration, and empowerment factors.

Learning Objectives:

- Deploy multi-agent systems targeting women-specific disparities via ASHA workflows.
- Simulate interventions using NFHS-5 / RMNCH+A benchmarks.
- Generate gender-fair Real-World Evidence (RWE).
- Translate insights into NHM / RMNCH+A policy recommendations.

2. Required Setup (Before Hands-on Session)

- Python 3.10+
- Install AutoGen: `pip install pyautogen`
- LLM access (OpenAI, Azure, Grok, or local via Ollama/LM Studio)
- Jupyter Notebook (recommended)

Quick Start Command:

```
pip install pyautogen pandas  
matplotlib
```

3. Hands-on Code Templates (AutoGen Multi-Agent System)

Core Setup (Save as `gender_health_agents.py`)

```
from autogen import AssistantAgent,
UserProxyAgent, GroupChat,
GroupChatManager
import pandas as pd
```

```
# LLM Configuration (replace with
your API key)
```

```
llm_config = {"config_list":
[{"model": "gpt-4o-mini",
"api_key": "YOUR_API_KEY"}]}
```

```
# Define Agents
```

```
user_proxy = UserProxyAgent(
    name="ASHA_Worker",
    human_input_mode="NEVER",
    max_consecutive_auto_reply=10,
```

```
code_execution_config={"work_dir":
"coding", "use_docker": False}
)
```

```
anemia_agent = AssistantAgent(  
    name="Anemia_Agent",  
    llm_config=llm_config,  
    system_message="You are an  
Anemia Risk Specialist for Indian  
women. Use NFHS-5 logic: hemoglobin  
<12, heavy periods, diet, caste/  
rural factors. Output risk score  
(Low/Med/High) + recommendations."  
)
```

```
maternal_agent = AssistantAgent(  
    name="Maternal_Agent",  
    llm_config=llm_config,  
    system_message="You are a  
Maternal Health Specialist. Focus  
on adolescent pregnancies, anemia,  
ANC visits, high-risk flags per  
RMNCH+A guidelines."  
)
```

```
safety_agent = AssistantAgent(  
    name="Safety_Agent",  
    llm_config=llm_config,
```

```
        system_message="You are a  
Domestic Violence Risk Specialist.  
Flag risks from household crowding,  
migration, empowerment, alcohol use  
(NFHS-5 patterns). Suggest  
confidential referral pathways."  
)
```

```
# Group Chat Manager
```

```
groupchat =
```

```
GroupChat(agents=[anemia_agent,  
maternal_agent, safety_agent],
```

```
messages=[], max_round=12)
```

```
manager =
```

```
GroupChatManager(groupchat=groupcha  
t, llm_config=llm_config)
```

```
# Example Usage
```

```
user_proxy.initiate_chat(  
    manager,
```

```
    message="Assess a 19-year-old  
rural SC woman, 4 months pregnant,  
Hb 10.2, heavy periods, lives in
```

crowded household, husband migrates for work."

)

Simulation with Sample Data

Create a small CSV (`sample_women.csv`) for batch simulation:

```
id,age,rural,sc_st,hemoglobin,pregnant,months_preg,heavy_periods,household_size,migration
1,19,1,1,10.2,1,4,1,7,1
2,28,0,0,13.5,0,0,0,4,0
```

Batch Script (Extend the above):

```
df =
pd.read_csv("sample_women.csv")
for _, row in df.iterrows():
    query = f"Assess woman: Age
{row['age']}, Rural:{row['rural']},
SC/ST:{row['sc_st']}, Hb:
{row['hemoglobin']}, Pregnant:
{row['pregnant']}, etc."
```

```
user_proxy.initiate_chat(manager,
message=query, silent=True)
```

4. Data Resources & References

- **NFHS-5 Full Report:** dhsprogram.com/pubs/pdf/FR375/FR375.pdf
- **NFHS-5 Factsheets & State Data:** nfhsiips.in
- **RMNCH+A Strategy:** [NHM Guidelines](#)18
- **ASHA Training Modules:** NHSRC / MoHFW handbooks on maternal nutrition and home-based care.

Open Datasets: DHS Program (registration required), OpenCity.in NFHS-5 extracts.

5. Governance & Ethics Checklist

- Use de-identified / synthetic data
- Bias audit for caste, rural/urban, religion
- Privacy: Align with ABDM / NDHM
- POSH & NHM Gender Guidelines compliance
- Human oversight for all high-risk flags

6. Customization Exercise (20-min Hands-on)

1. Modify one agent's system message for your state/context.
2. Add a new **Nutrition Agent** or **IFA Compliance Agent**.

3. Run simulation on 5-10 synthetic cases.
4. Discuss: How would you integrate this into ASHA mobile app (e-Sanjeevani style)?

7. Expected Outcomes & Policy Links

- Projected gains: Improved anemia detection, early ANC, violence identification.
- Link to NHM Nutrition, RMNCH+A, POSH.

Feedback Form (Please return or email)

1. Most useful part: _____
2. Suggestions for code/policy: _____
3. Would you implement this? (Y/N/Maybe)

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Thank you! Let's advance women's health equity through responsible AI.

Printing Tips:

- Print as PDF booklet (8-12 pages).
- Include QR codes linking to GitHub repo (you can create one with these templates).

- Optional: Add NFHS-5 charts or ASHA workflow diagrams.