Exercise 2: Case-Based Risk Review

Exercise overview

In this exercise, you will evaluate an AI risk register for a model designed to predict hospital readmissions using electronic health records (EHR). The activity focuses on collaborative review and brainstorming to identify risks, assess likelihood and impact, and recommend mitigation and monitoring strategies.

Use case: Hospital readmission prediction system

Background

A healthcare organization implements an AI model to predict which patients are at high risk of being readmitted to the hospital within 30 days. The model uses EHR data, including diagnosis history, demographics, medication, and discharge summaries. Concerns have been raised regarding fairness, transparency, data handling practices, and clinical reliability.

This exercise simulates a real-world governance review of such systems using an AI risk register format.

In this exercise, you will:

- Explore the purpose and structure of an AI risk register
- Review a pre-built risk register template
- Analyze a sample use case (EHR-based AI system) to identify potential risks
- Collaboratively brainstorm mitigation and monitoring strategies
- Share team insights and discuss best practices in AI governance

Estimated completion time

30 minutes

Task 1: Explore the AI risk register

Objective: Learn the purpose and format of an AI risk register

1. A risk register is a structured tool used to document and manage risks.
2. Typical fields: Risk description, Likelihood/Impact, Mitigation, Risk owner
3. Helps track risks throughout the AI lifecycle.

Task 2: Analyze the use case and populate the risk register

Objective: Break down the AI system and apply your understanding

1. Input data: Patient history, medication, clinical notes
2. Output: 30-day readmission risk score
3. Users: Doctors, care coordinators, hospital admins
4. Concerns: Data quality, bias against age/disability groups, consent and legal exposure

Action:

Open the blank risk register template on the desktop of the lab machine. Populate at least three new risks based on your interpretation of the AI use case.

Fill in the following fields for each identified risk:

- Risk description
- Likelihood and impact
- Mitigation strategy

Task 3: Risk identification and categorization

Objective: List risks in key categories

- Bias/fairness: Underprediction for elderly or underrepresented groups
- Privacy/consent: Use of sensitive medical data without clear consent
- Explainability: Black-box predictions without clinician understanding
- Clinical risk: False positives may lead to unnecessary interventions

Task 4: Group brainstorm on mitigation and monitoring

Objective: Propose appropriate actions per risk

1. Split into small groups (e.g., breakout rooms or in-class teams).
2. Using the risk register template from task 2, each group should:
   - Pick at least two identified risks
   - Propose a mitigation strategy
   - Add a monitoring mechanism

Example mitigation ideas:

- Run differential performance testing by age, race, comorbidity
- Use interpretable ML models or post-hoc explanations (e.g., SHAP)
- Limit access and encryption for PHI fields
- Integrate continuous monitoring with clinical feedback loop

Task 5: Present and reflect - governance discussion

Objective: Reflect on team learnings and improve governance awareness.

1. Team sharing: Each group presents:
   - Their top two risks
   - Proposed mitigations
   - Any challenges or tradeoffs discussed
2. Reflection prompt (to capture in a shared doc/chat board):
   - What governance principle was most difficult to apply and why?
   - How does collaboration improve AI governance reviews?
   - What would you include in a real-world compliance process?
3. Submit your team's reflections through the designated platform (e.g., shared document, poll tool, or collaboration board) as directed by your facilitator.

Final output: Sample risk register table

Risk description	Likelihood and impact	Mitigation strategy	Risk owner
Model bias against older patients	Medium likelihood, High impact	Run fairness audit and retrain on balanced data	Data Science Lead
Lack of transparency	High likelihood, Medium impact	Integrate SHAP explanations	ML Product Manager
Consent issues with EHR data	Medium likelihood, High impact	Ensure compliance with HIPAA and obtain patient opt-in	Legal and Compliance team

Exercise review

1. Which element is NOT part of a typical AI risk register?
   A. Risk owner
   B. Fairness metric
   C. Mitigation strategy
   D. Likelihood & impact
2. What is the primary reason to include a Risk Owner field?
   A. To track datasets used
   B. To assign accountability for mitigation
   C. To measure model accuracy
   D. To log audit frequency

STOP

You have successfully completed this exercise.