**Literature Review: Cloud Security Risks in the Healthcare Sector**

**1. Introduction**

The healthcare sector is increasingly leveraging cloud computing to enhance data storage, scalability, and remote access. However, while cloud adoption improves service efficiency and interoperability, it introduces significant security risks. These include data breaches, regulatory non-compliance, and ethical concerns. This literature review explores the security implications of cloud computing in healthcare, organized into thematic areas such as data protection, legal frameworks, and ethical considerations.

**2. Thematic Focus**

**2.1 Data Confidentiality and Integrity**

Farahani, Firouzi and Chang (2021) identify that cloud-based healthcare systems are prone to data breaches due to increased attack surfaces introduced by third-party services. These concerns revolve around unauthorized access, data loss, and tampering—especially during transmission and storage. Zhang and Liu (2021) reinforce this by advocating for zero-trust architectures and dynamic access controls as preventive mechanisms for data integrity.

**2.2 System Interoperability and Integration**

Cloud platforms offer flexibility in connecting disparate healthcare systems, yet Kuo (2019) warns that inconsistent data formats and system incompatibility can result in data loss and clinical errors. A lack of standardized interfaces affects the continuity of care, undermining the intended benefits of seamless data sharing.

**3. Legal and Regulatory Considerations**

The international nature of cloud infrastructure complicates data sovereignty and legal accountability. Sultan (2018) highlights the difficulty of aligning cloud operations with local regulations such as HIPAA and GDPR. Jurisdictional ambiguity arises when data crosses national borders, leading to unclear legal responsibilities between healthcare providers and cloud vendors. According to Ali, Osman and Fatima (2018), this legal vagueness demands clearer contractual agreements and stricter compliance monitoring.

**4. Ethical and Professional Considerations**

From a professional ethics standpoint, computing professionals in healthcare are obligated to maintain trust, confidentiality, and accountability. The British Computer Society (BCS) Code of Conduct and the ACM Code of Ethics both underline responsibilities such as ensuring public good, avoiding harm, and honoring legal obligations. Failure to uphold these principles can damage patient trust and institutional credibility. As Farahani, Firouzi and Chang (2021) suggest, proactive auditing, secure design practices, and ethical transparency are critical.

**5. Summary of Research Trends**

The reviewed literature consistently calls for a **multi-layered security model** that integrates legal compliance, technical safeguards, and ethical responsibility. Farahani et al. (2021) and Zhang and Liu (2021) argue that security must be designed into cloud systems from the ground up. Meanwhile, Ali et al. (2018) emphasize the need for continuous risk assessments and collaborative governance. While solutions vary, the academic consensus underscores that cloud security in healthcare is not a purely technical issue, but a multidimensional challenge requiring policy, process, and people alignment.

**References (Harvard Style)**

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Cloud Ready

Recent studies have highlighted the pressing security challenges posed by cloud adoption in the healthcare sector, particularly regarding patient data confidentiality and system resilience (Farahani, Firouzi and Chang, 2021; Zhang and Liu, 2021). While cloud infrastructure offers scalability and accessibility, it also introduces new vulnerabilities (Ali, Osman and Fatima, 2018). For instance, Sultan (2018) notes that compliance with regulatory frameworks such as HIPAA or GDPR is often inconsistent across providers. Furthermore, Kuo (2019) emphasizes that achieving interoperability and data integrity while ensuring security remains a key challenge.