



**NORDIC STRATEGY
AND NATIONAL ACTION
PLANS FOR THE USE
OF AI IN CANCER
TREATMENT**

PROJECT FLORENCE
2022-2025



Executive Summary

The FLORENCE project has, over three years, established a pioneering cross-border collaboration between Denmark, Norway, and Sweden to advance the use of artificial intelligence (AI) in colorectal cancer treatment. Through joint development of federated learning infrastructure, harmonization of health data using the OMOP model, and clinical implementation efforts, the project has created a foundation for secure, trustworthy, and scalable AI solutions in healthcare.

This strategy outlines the joint Nordic vision for continued use of AI in cancer treatment and presents national action plans for Denmark, Sweden, and Norway. The strategy builds on the results, experiences, and insights gained in FLORENCE and aims to guide future implementation, scaling, and research collaboration across the region.

Introduction & Background

The FLORENCE project was initiated to explore how AI can be integrated into clinical decision-making to support colorectal cancer treatment. The consortium, led by the Center for Surgical Science at Zealand University Hospital, included Oslo University Hospital and the Norwegian Institute of Public Health (The Cancer Registry of Norway), Lund University, and DTU Computerome. Together, these partners developed

both technical and organizational frameworks for using AI responsibly and effectively in a healthcare context.

Throughout the project, partners have demonstrated how federated learning can enable cross-border data analysis without transferring sensitive patient information, ensuring compliance with GDPR and national data protection laws.



Key Results and Strategic Learnings

The FLORENCE project has achieved several key milestones that advance the responsible use of artificial intelligence (AI) in cancer care across the Nordic region.

A key achievement has been the implementation of a federated learning infrastructure built on the Vantage6 platform. This technology allows AI models to be trained across multiple data sources — or nodes — without sharing or moving sensitive patient information. Instead, data stays securely within each country while algorithms travel between nodes to learn from the distributed data-sets. This approach ensures full compliance with GDPR

and national data protection frameworks.

The Netherlands Comprehensive Cancer Organisation (IKNL) has made a valuable contribution to this work by supporting the harmonisation of data through the OMOP CDM framework and advising on the use of integrated federated tools such as Vantage6. Their expertise has helped strengthen the project's technical foundation and promote interoperability and data-driven insights across national nodes.

Partners in Denmark and Norway have developed harmonised databases using the OMOP Common Data Model

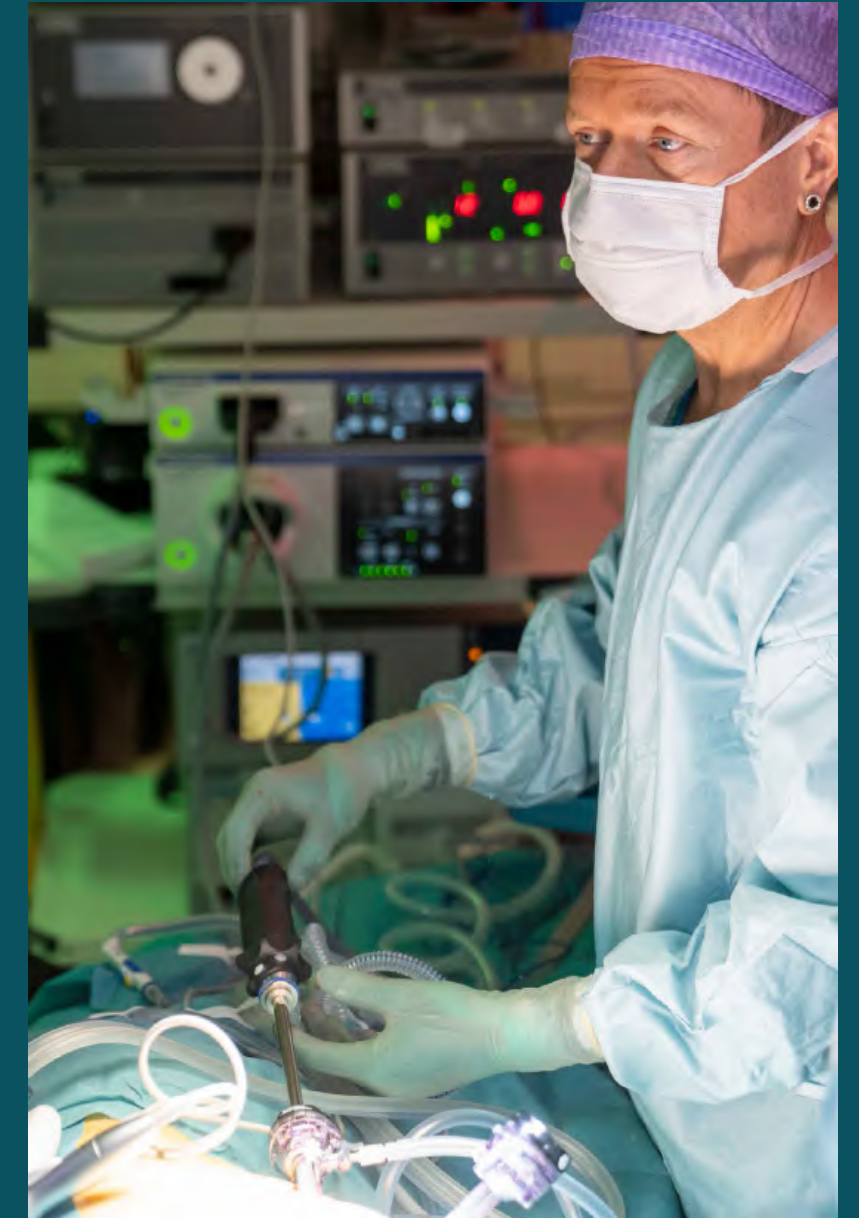
(OMOP CDM), allowing comparable data analysis across countries. IKNL has provided essential expertise in integrating Vantage6 with OMOP CDM, helping connect nodes in Denmark, Norway, and Sweden to support federated analytics and long-term collaboration.

Clinically, an AI-based decision-support model has been piloted at Zealand University Hospital in Denmark to assist multidisciplinary team (MDT) discussions in colorectal cancer surgery. Early feedback from clinicians indicates that the model supports decision-making and could improve patient outcomes. In Norway, predictive models

based on national registry data have been developed, further validating the approach.

Lund University has contributed scientific advances on fairness, interpretability, robustness, and privacy, publishing several peer-reviewed papers that strengthen the foundation for safe and transparent AI in healthcare.

Together, these results demonstrate how technical innovation and strong Nordic collaboration can drive the secure and ethical use of AI in clinical practice — setting the stage for continued cross-border cooperation and real-world impact in cancer treatment.



6 STRATEGIC RECOMMENDATIONS

The FLORENCE project has shown that cross-border collaboration and federated learning can play a vital role in advancing the safe and effective use of AI in cancer care. The results demonstrate that technical innovation must go hand in hand with strong governance, clinical relevance, and long-term sustainability.

The partners identified several key insights for the future use of AI in healthcare - both within colorectal cancer and beyond:

- ▶ AI models must be developed with clinical integration in mind from the outset. Successful implementation requires early alignment with hospital workflows, user needs, and regulatory requirements to ensure that AI tools can be seamlessly embedded in clinical practice.
- ▶ Federated learning offers a practical and privacy-preserving solution for cross-border collaboration. Building on the existing Nordic infrastructures such as Vantage6 and harmonised OMOP CDM databases will make it possible to share insights across institutions without moving sensitive data.



- ▶ Transparency, fairness, and explainability are essential for building clinical trust and ensuring that AI tools improve patient safety and equality in treatment.
- ▶ Early involvement of clinicians, regulatory bodies, and industry partners is crucial for creating clinically relevant and legally compliant solutions. Public-private partnerships should be encouraged to bridge the gap between research, regulation, and implementation.
- ▶ Strengthen collaboration between clinicians, data experts, and health IT vendors to assess and improve data quality, completeness, and comparability, enabling the effective use of pan-European health data for developing clinical AI tools within the framework of the European Health Data Space
- ▶ Dedicated funding and clear governance frameworks are needed to support long-term maintenance, updates, and certification of AI tools. A shared Nordic approach to governance would simplify implementation and ensure consistency across healthcare systems.

NATIONAL ACTION PLANS



Denmark

Denmark offers a strong foundation for AI development in cancer treatment due to its highly digitalized healthcare system and comprehensive national registries. However, regulatory uncertainty and complex approval processes remain barriers to implementation.

The Danish action plan emphasizes strengthening collaboration between hospitals, regulatory authorities, and private companies to accelerate implementation. Public-private partnerships will play a key role in ensuring innovation, compliance, and scalability. Future focus areas include expanding the Florence model to other cancer types and establishing clear national guidelines for AI validation and deployment.



Sweden

Sweden's advanced digital infrastructure and strong tradition of healthcare research create excellent conditions for integrating AI into cancer care. However, strict privacy regulations and regional variations in IT systems pose challenges for data access and interoperability.

The Swedish action plan prioritizes developing national evaluation tools for AI robustness and fairness, and training healthcare professionals in AI use. Collaboration between academic institutions, hospitals, and technology companies will ensure that AI solutions remain clinically relevant and ethically sound.



Norway

Norway has made major progress through the Cancer Registry's establishment of a national OMOP database and contribution to the federated learning infrastructure. Strict data protection requirements have driven innovative approaches to secure data handling, such as the use of Vantage6.

The Norwegian action plan focuses on continuing development of predictive models in clinical practice, expanding the use of federated learning, and working closely with regulatory authorities to streamline approval and implementation processes. Key collaborators include the Cancer Registry, Oslo University Hospital, and technology providers such as DIPS and Sykehuspartner.

Future Outlook & Conclusion

FLORENCE has demonstrated the potential of AI to transform cancer treatment through collaboration across borders. The lessons learned and infrastructure developed form a strong foundation for future Nordic cooperation in healthcare AI. By building on these results, the Nordic countries can lead the way in developing ethical, transparent, and impactful AI solutions that improve patient outcomes and drive medical innovation.



PROJECT PARTNERS



Lead partner:
Professor Ismail Gögenur
Center for Surgical Science (CSS), Zealand University Hospital

9.98

921



Interreg



**Medfinansieret af
Den Europæiske Union**

**Læs mere på
florence.forskning.eu**

Öresund-Kattegat-Skagerrak