



Centre for Innovative Human Systems (CIHS)

# Building Socio-Technical Risk Evidence Bases During Covid

## The Access Risk Knowledge (ARK) Platform in St James's Hospital and Dublin Fire Brigade

23 May 2022

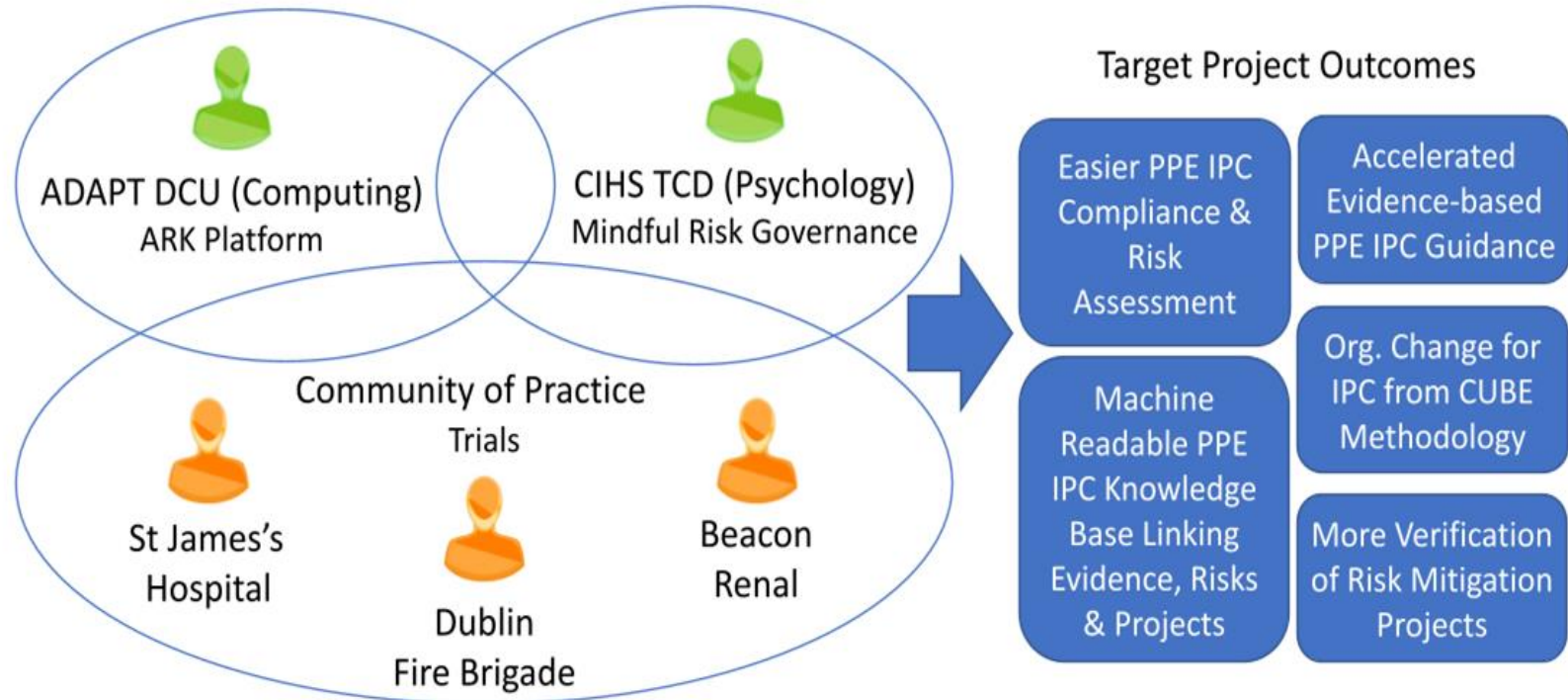
This project is supported by SFI under the COVID-19 Rapid Response Funding grant 20/COV/8463 and the ADAPT Centre for Digital Content Technology which is funded under the SFI Research Centres Programme (Grant 13/RC/2106\_R2) co-funded under the European Regional Development Fund.



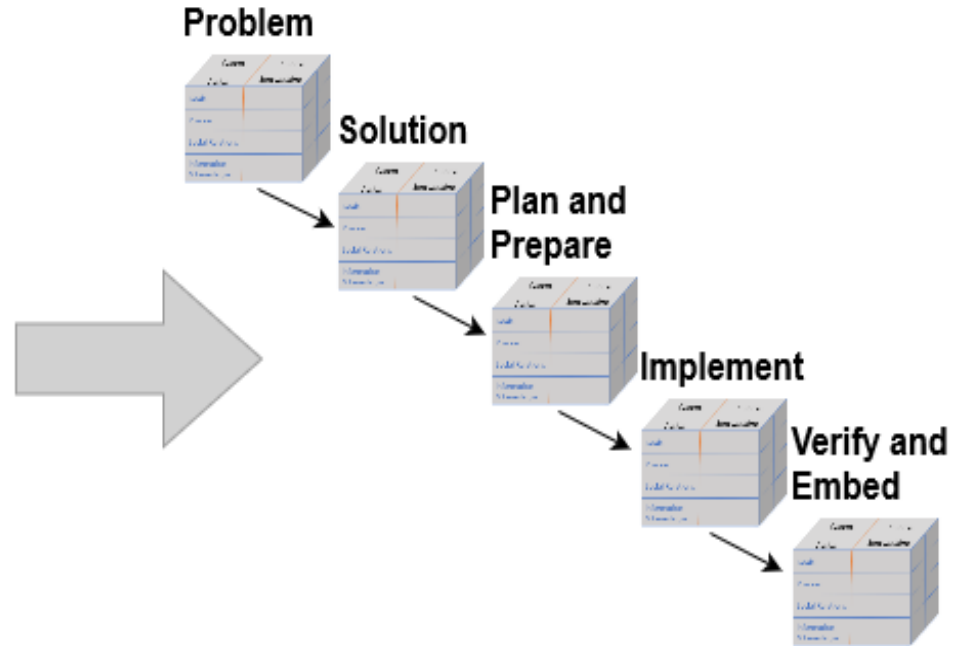
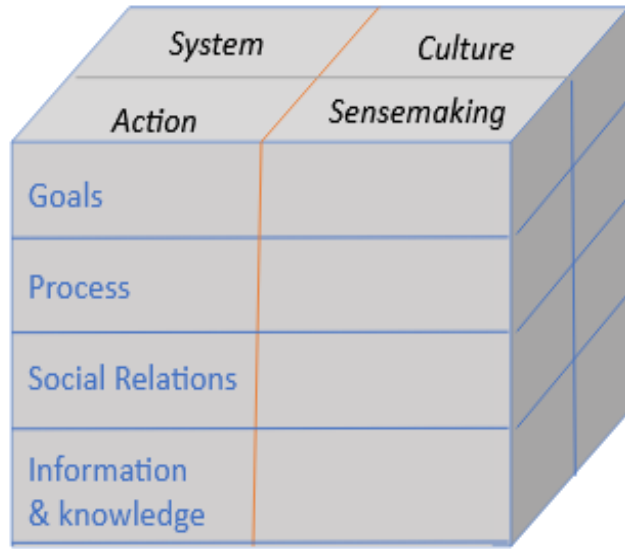
# Agenda

- ARK-Virus Project Overview
- CUBE Socio-Technical Systems Analysis
- ARK (Access Risk Knowledge) Platform
- Covid Use Cases
- Building the Unified Risk Graph
- Technical Challenges and Standards-based Solutions
- Conclusions and Interim Impacts

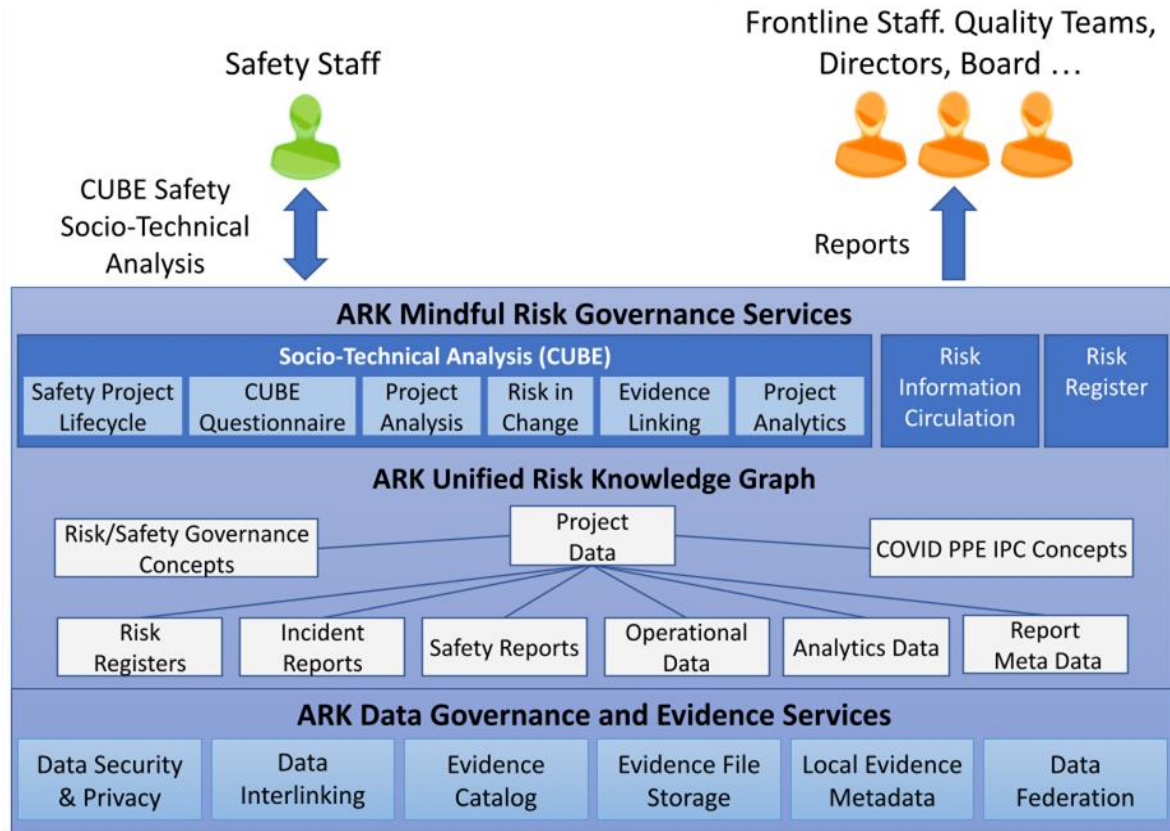
# ARK Virus Project Overview



# Cube Socio-Technical Systems Analysis Framework



# ARK (Access Risk Knowledge) Platform



# Deployment Use Cases During Covid

## **St James's Hospital:**

**Activity:** Oversight, monitoring of Environment Hygiene element of PCHCAI (Prevention and Control of Healthcare Associated Infections) programme.

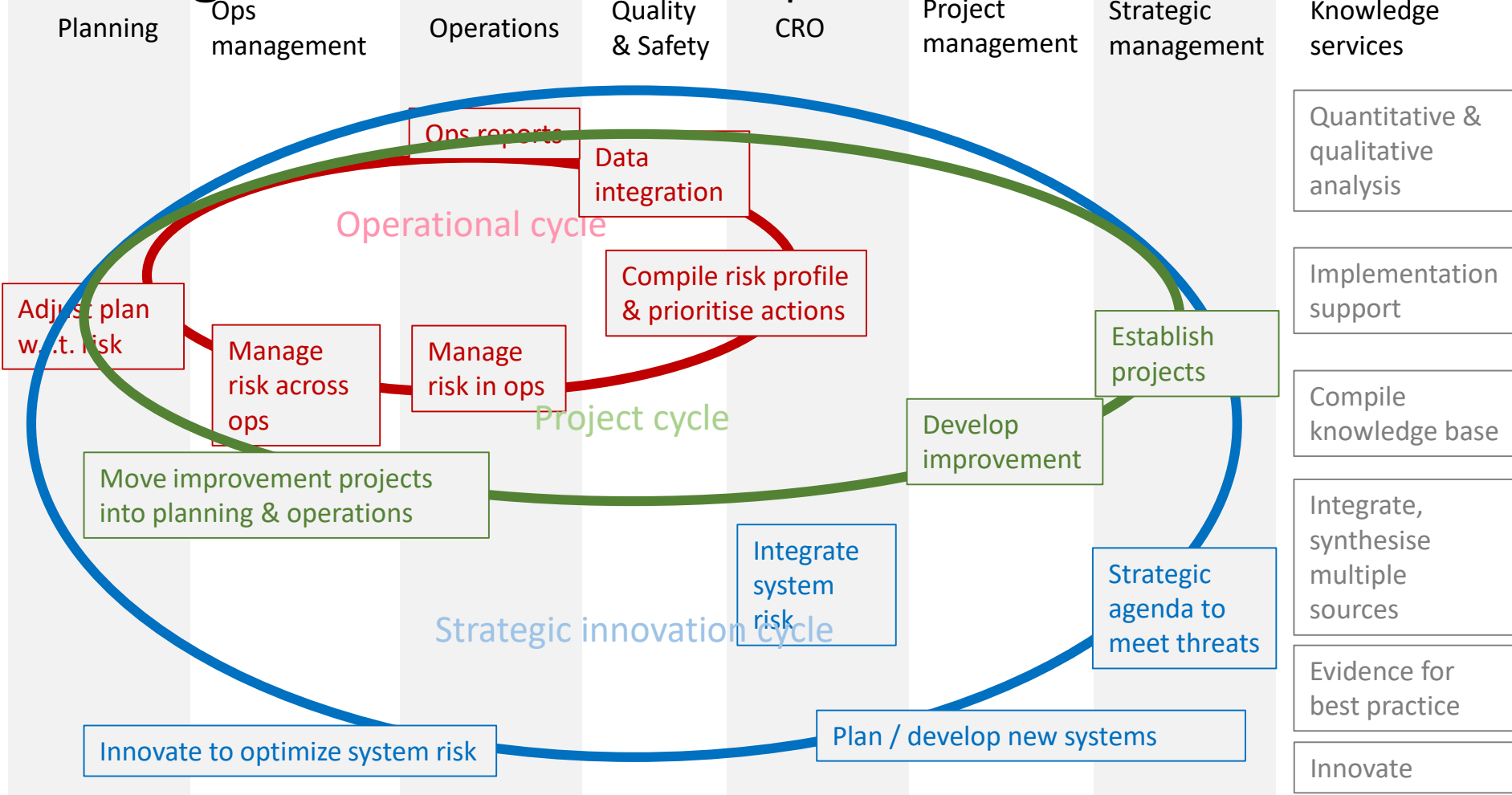
**Safety staff:** SJH Quality and Safety Improvement Directorate

## **Dublin Fire Brigade:**

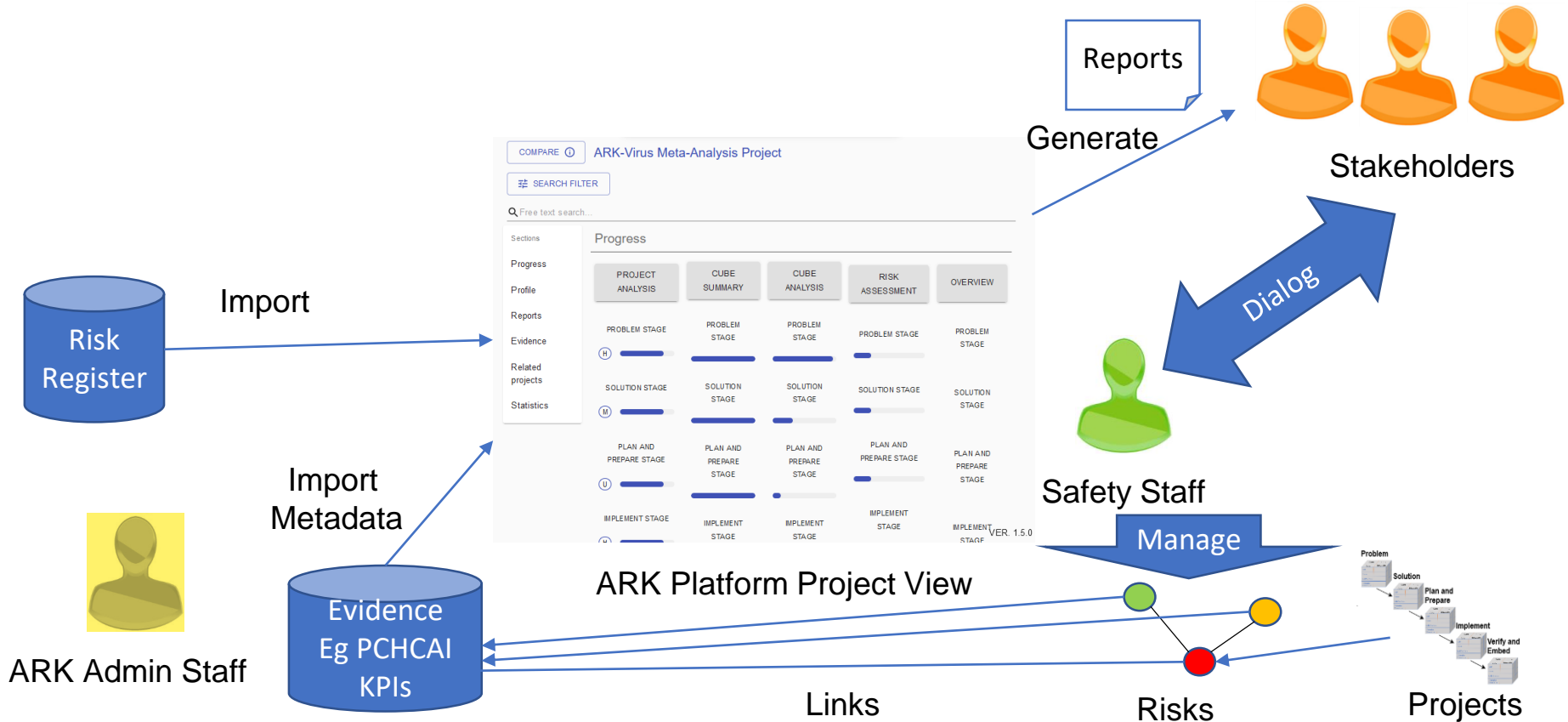
**Activity:** Managing high numbers of on-station close contacts and associated staff shortages, especially on ambulance service

**Safety staff:** DFB Health and Safety

# Building the Unified Risk Graph



# What does this look like in Practice?



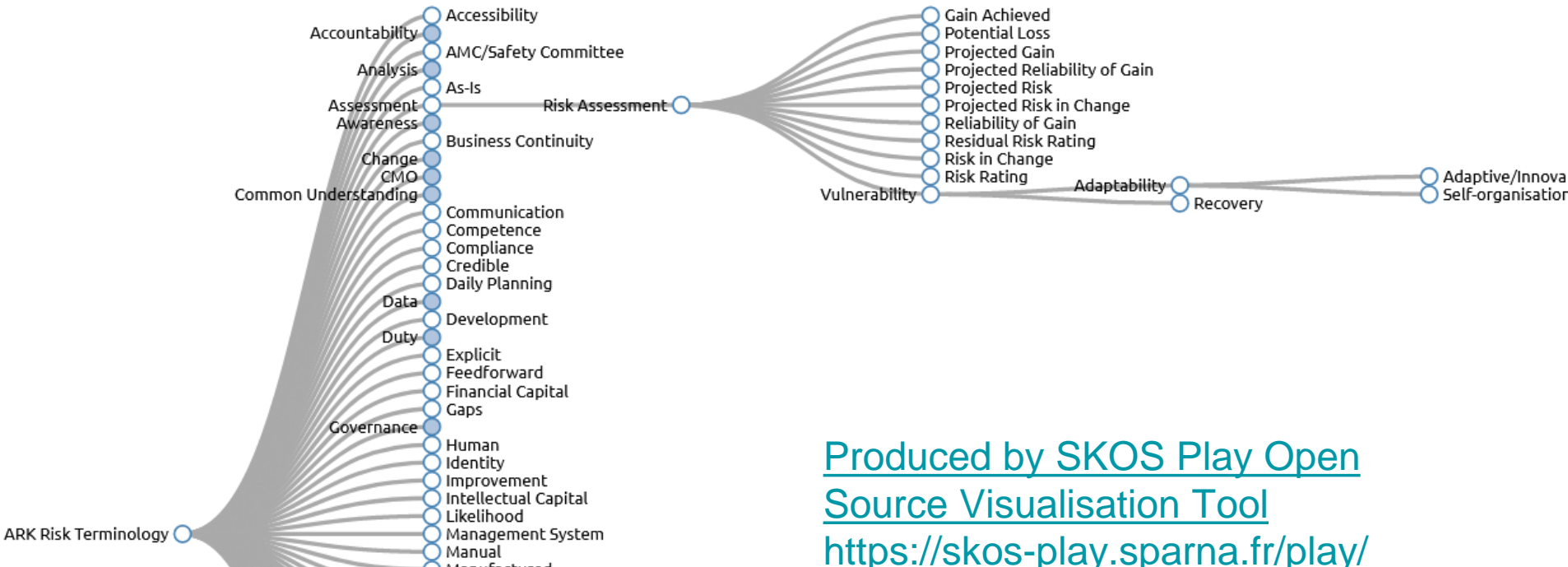


# Technical Challenges and Standards-based Solutions

- **Sensitive data sharing** – W3C DCAT Metadata-based data linkage, W3C community specification DPV
- **Knowledge interoperability** – W3C OWL, W3C SKOS ontologies and taxonomies, ISO 31073:2022 Risk management — Vocabulary, HSE Integrated Risk Management Policy
- **Risk lifecycle** - W3C PROV, ISO 31000 Risk management, HSE Integrated Risk Management Policy
- **Data Governance** - W3C DCAT, W3C PROV, W3C DQV, W3C SHACL

# Open Tool Chains: A Benefit of Standards

[help](#)



Produced by [SKOS Play Open Source Visualisation Tool](#)  
<https://skos-play.sparna.fr/play/>

# Conclusions and Interim Impact

- Standards at core of our work
- Platform impacts
  - Engages users and range of evidence and analysis
  - Reports improve workflow, help synthesis & aid communication
  - Supports culture of data governance
- Community of Practice impacts
  - Weekly and monthly meetings act as supportive CoP
  - Building sharable evidence

# ARK-Virus Team

**DCU:** Rob Brennan (PI), Lucy McKenna, Junli Liang, Julio Hernandez, Maryam Basereh, Malick Ebiele

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Read More

1. ARK Platform website: <https://openark.adaptcentre.ie/>
2. McDonald, N.; McKenna, L.; Vining, R.; Doyle, B.; Liang, J.; Ward, M.E.; Ulfvengren, P.; Geary, U.; Guilfoyle, J.; Shuhaiber, A.; Hernandez, J.; Fogarty, M.; Healy, U.; Tallon, C.; Brennan, R. Evaluation of an Access-Risk-Knowledge (ARK) Platform for Governance of Risk and Change in Complex Socio-Technical Systems. *Int. J. Environ. Res. Public Health* **2021**, *18*, 12572. <https://doi.org/10.3390/ijerph182312572>

# ARK Ontologies for Risk Knowledge Capture and Sharing

- **ARK Cube** (OWL): this module defines the concepts and relationships used in the CUBE risk management methodology and the HSE Risk Management Model.
- **ARK Terminology** (SKOS): this module defines the additional terms used in the ARK system, in the socio-technical risk management domain.
- **ARK Platform** (OWL) defines platform concepts like user permissions
- **ARK Health** (SKOS) defines additional HSE Risk Management and Clinical Domain terms, especially Covid PPE IPC.
- **AIR (Adverse Incident Report) ontology** (OWL)– supports knowledge extraction from SJH AIRs
- **AIR Categories Taxonomy** (SKOS) – describes SJH taxonomy of AIR categories
- <https://openark.adaptcentre.ie/>