

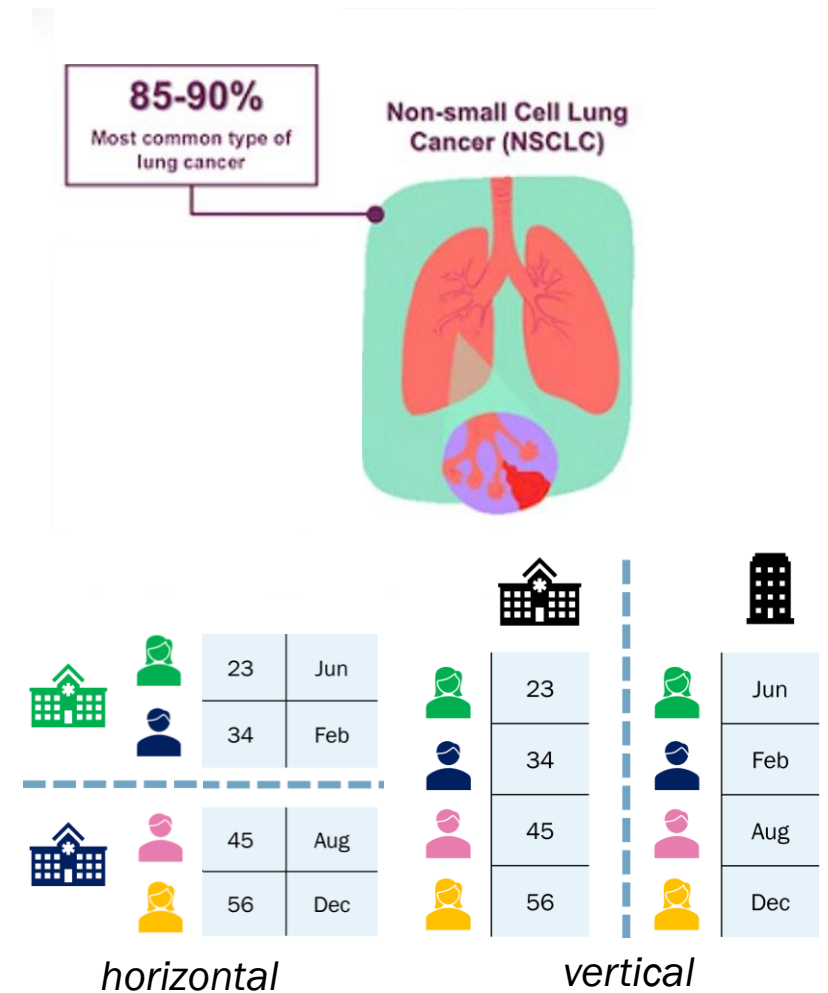
LANCELOT: PRIVACY-PRESERVING ANALYSES ON FEDERATED HEALTHCARE DATA

Ton Peters, Bart Kamphorst, Nigel Hughes, Sander Dalhuisen,
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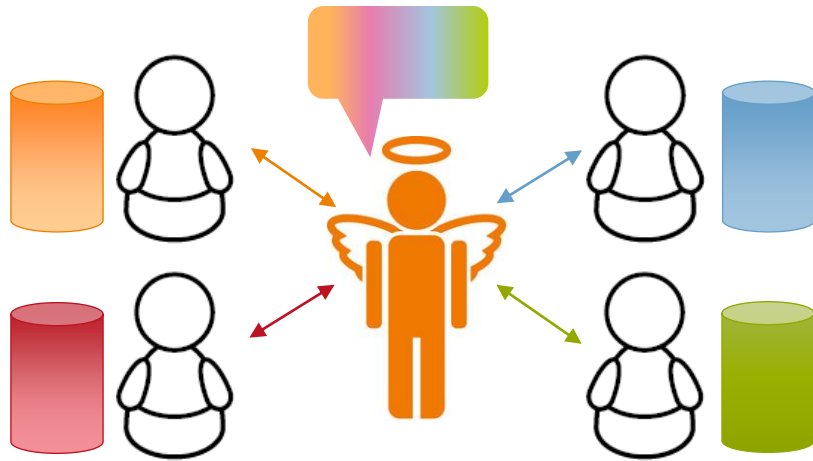
› LANCELOT: REDUCE IMPACT OF LUNG CANCER BY MEANS OF SECURE DATA SHARING

- › Goal: predict occurrence of long-term endpoints from variables characterizing the patient cohort
- › Challenge: data is distributed *vertically*
 - › Clinical data: diagnostics, blood counts, comorbidities, comedications, ...
 - › Pathological data: cell types, tumor characteristics, ...
 - › Demographics, patient reported outcomes, environmental data
- › Contribution: building blocks for privacy-preserving analysis on distributed data

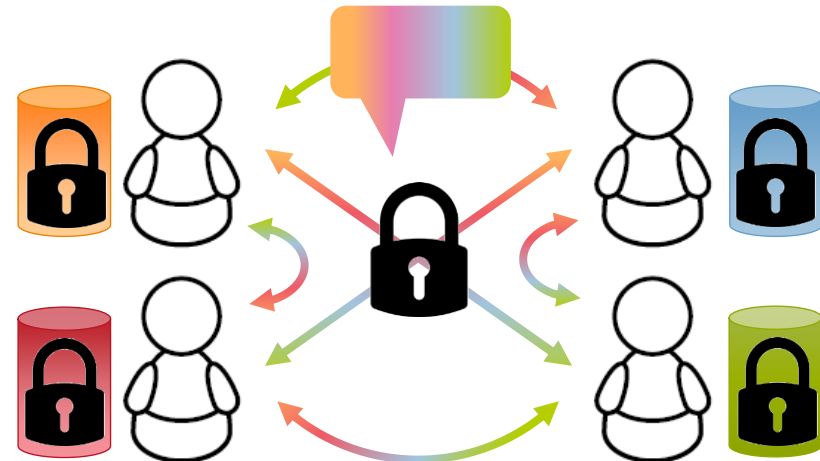


› SECURE MULTI-PARTY COMPUTATION (MPC) AS ENABLER OF PRIVACY-PRESERVING ANALYSES

From trusted third parties...

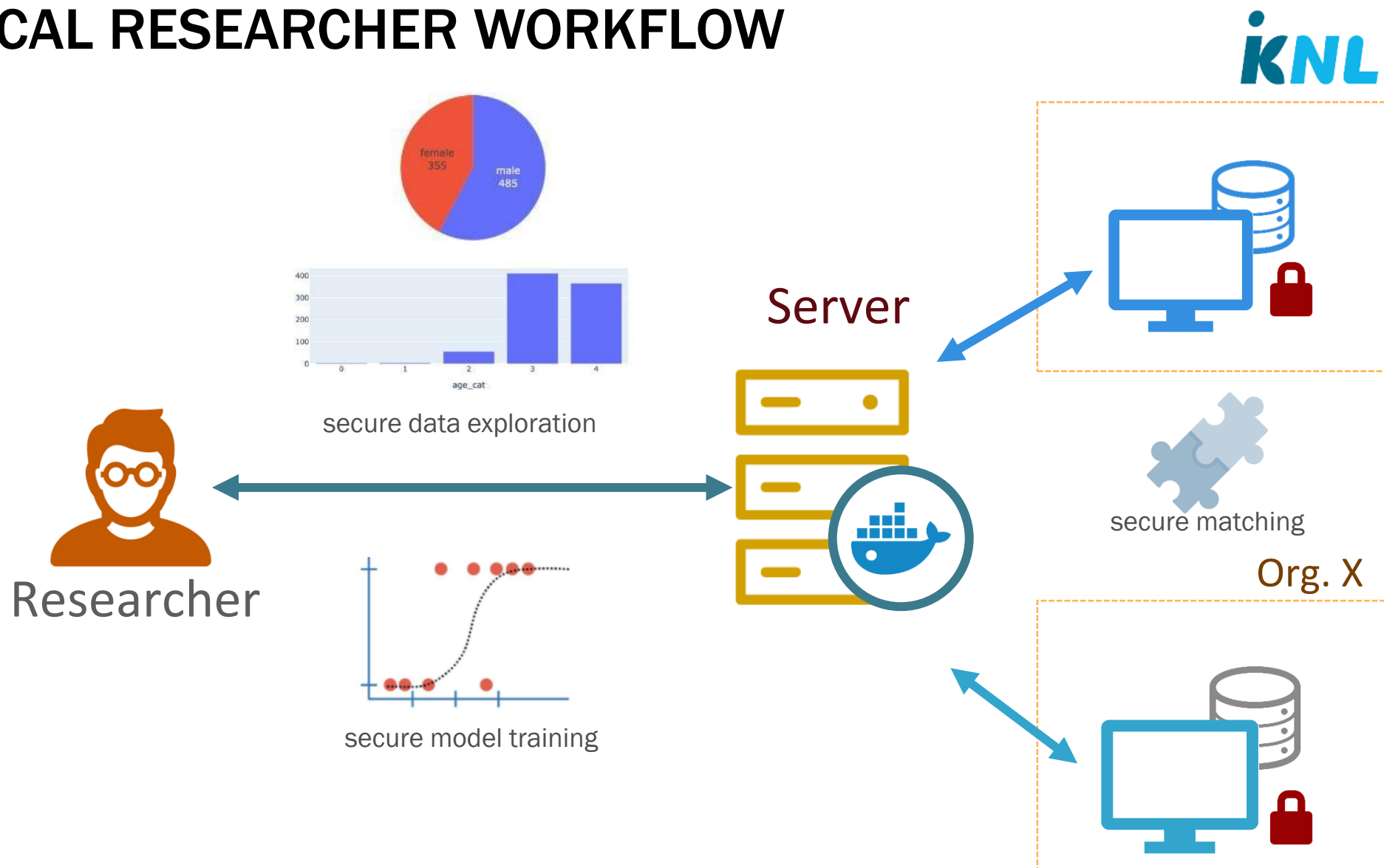


...to secure-by-design collaborations



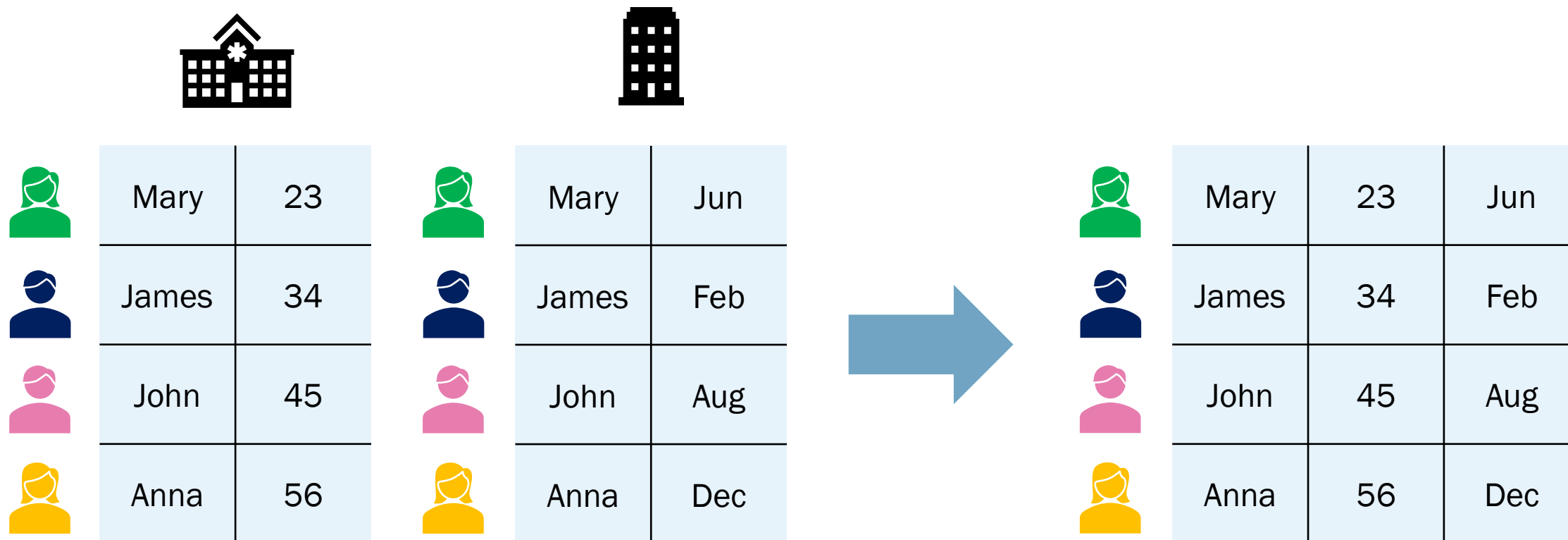
- › Obtain insight ~~through a third party~~ collaboratively
- › Underlying data is ~~revealed to the third party~~ not revealed
- › Cryptographic approach yields well-formulated *privacy guarantees*
 - › Adhere to principles such as data minimization, proportionality, purpose limitation, ...

ANALYSIS OF DISTRIBUTED DATA CLINICAL RESEARCHER WORKFLOW

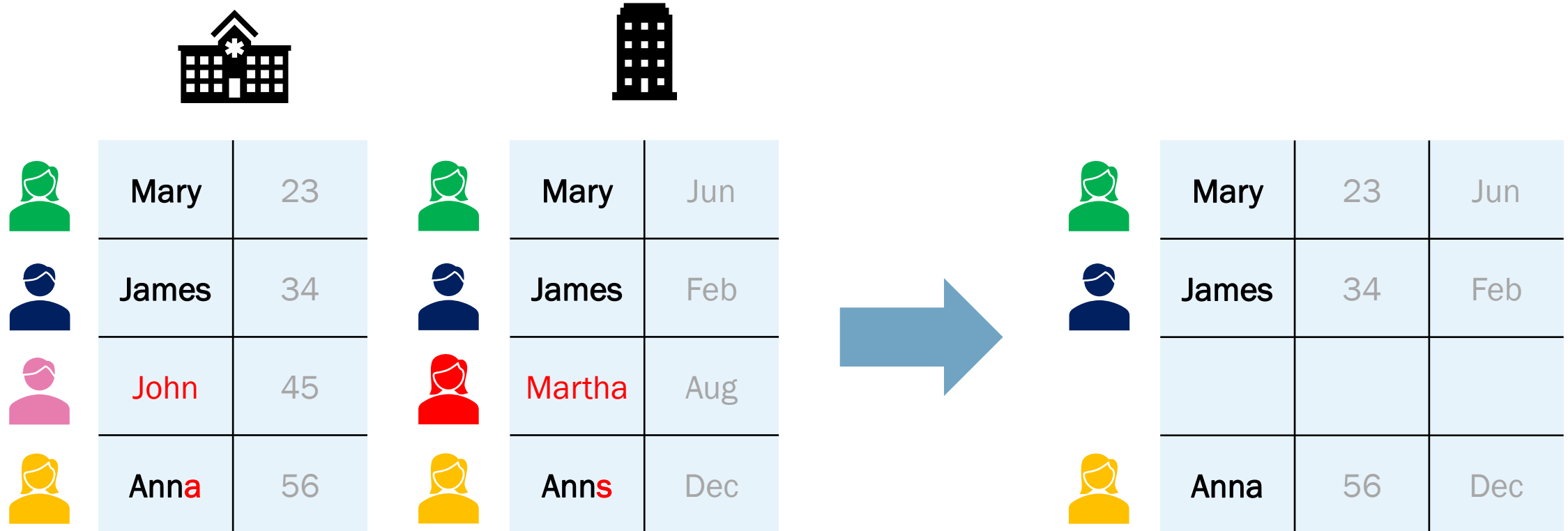


KEY CHALLENGE: DEAL WITH VERTICALLY PARTITIONED DATA

MPC CAN MATCH PATIENT DATA SECURELY



KEY CHALLENGE: DEAL WITH VERTICALLY PARTITIONED DATA EVEN FOR REAL-WORLD DATA



› WRAP-UP

› LANCELOT

- › ... aims to reduce the impact of cancer through insights from data from different organizations
- › ... by analyzing federated data in a privacy-preserving manner

› Secure multi-party computation

- › ... allows for privacy-preserving analyses in the health domain
- › ... even if data is vertically-distributed
- › ... even if there are no unique patient identifiers

› LANCELOT

- › ... is part of a greater effort and acknowledges the community: <https://github.com/TNO-MPC/>
- › ... continues to strive for value-based health care in the follow-up HERACLES program