

# Data Model Maturity Assessment

Please select exactly one answer per question. Select the option that best describes your current situation today, not the situation you are working toward.

## Dimension 9 — Data Model

**Definition\*:** Availability of a clear, documented data model that provides structure and standardization. A local standard is a code list agreed inside your own organization; a national or international standard is one maintained outside it, such as ICD-10, SNOMED CT, or LOINC.

### 1. What data model do you use?\*

- |                                                                                                                                                  |        |
|--------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| <input type="checkbox"/> We have no data model; the structure is whatever the source system produces.                                            | 1 pt.  |
| <input type="checkbox"/> A data model exists and is accepted internally, but important fields are free text or uncoded.                          | 2 pts. |
| <input type="checkbox"/> Key fields are coded using a local standard and kept up to date.                                                        | 3 pts. |
| <input type="checkbox"/> Important fields use a national or international code system, and we keep them current.                                 | 4 pts. |
| <input type="checkbox"/> The data model itself conforms to an international standard, and key fields use national or international code systems. | 5 pts. |

You can support this answer with: your data model documentation, entity-relationship diagram.

### 2. How are your key fields coded?\*

- |                                                                                                                                |        |
|--------------------------------------------------------------------------------------------------------------------------------|--------|
| <input type="checkbox"/> Not coded, free text.                                                                                 | 1 pt.  |
| <input type="checkbox"/> Some fields coded with an in-house list.                                                              | 2 pts. |
| <input type="checkbox"/> Key fields coded with a local standard.                                                               | 3 pts. |
| <input type="checkbox"/> Key fields coded with a national or international standard, for example, ICD-10, SNOMED CT, LOINC.    | 4 pts. |
| <input type="checkbox"/> All fields relevant for secondary use coded with an international standard, with mappings maintained. | 5 pts. |

You can support this answer with: your code list register, field-to-terminology mapping table.

### 3. How is the data model maintained?\*

- |                                                                                                            |        |
|------------------------------------------------------------------------------------------------------------|--------|
| <input type="checkbox"/> No updates. The model is whatever it was when it was created.                     | 1 pt.  |
| <input type="checkbox"/> Updated only when a source system changes.                                        | 2 pts. |
| <input type="checkbox"/> Reviewed and updated on a fixed schedule.                                         | 3 pts. |
| <input type="checkbox"/> Reviewed on a fixed schedule and aligned with new releases of the standards used. | 4 pts. |
| <input type="checkbox"/> As above, with a version history and a documented change procedure.               | 5 pts. |

You can support this answer with: the version history of your data model, change log.

### 4. How easily can your data be combined with data from other organizations?\*

- |                                                                                                                                                       |        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| <input type="checkbox"/> There is no route. Every combination is a one-off project, negotiated and mapped from scratch.                               | 1 pt.  |
| <input type="checkbox"/> A reusable export route exists, but our data model is not standardized, so every new partner needs its own mapping.          | 2 pts. |
| <input type="checkbox"/> We exchange data with local partners in a format agreed between us, and the mapping is documented and reused.                | 3 pts. |
| <input type="checkbox"/> We exchange data in a national or international format, for example, HL7 FHIR, so partners need no bespoke mapping.          | 4 pts. |
| <input type="checkbox"/> Our data conforms to an international standard and can be combined across organizations and borders without further mapping. | 5 pts. |

You can support this answer with: your export formats, interface specifications, examples of past exchanges.

### 5. Is the data model documented for the people who use your data?\*

- |                                                                                                         |        |
|---------------------------------------------------------------------------------------------------------|--------|
| <input type="checkbox"/> It is not documented.                                                          | 1 pt.  |
| <input type="checkbox"/> It exists as a diagram or spreadsheet somewhere.                               | 2 pts. |
| <input type="checkbox"/> A documented model covering entities, fields, and relationships is maintained. | 3 pts. |
| <input type="checkbox"/> Documented and published to data users with each version.                      | 4 pts. |
| <input type="checkbox"/> Documented, versioned, published, and machine-readable.                        | 5 pts. |

You can support this answer with: the published model documentation, catalog entry.

### YOUR NOTES FOR THIS DIMENSION

What sits behind these answers: the practices and tools you rely on, recent improvements, and the gaps that explain the lower scores. This is the material for the supporting narrative on the Overall Score sheet.

Add up the points of all 5 answers and divide by 5. Keep one decimal.

Round the dimension score down to the nearest whole number.

**Level 1**  
**Initial**  
Starting out · 1 Point

Your five answers average to one level. Each row describes what that level typically looks like across all five questions, so you may be ahead of it on some points and behind on others.

|                             |                                                                                                    |
|-----------------------------|----------------------------------------------------------------------------------------------------|
| <b>Level 1</b><br>Initial   | No data model, no coding, no maintenance, nothing documented, and no way to combine data.          |
| <b>Level 2</b><br>Emerging  | A model exists internally with in-house lists; updated only when a source system changes.          |
| <b>Level 3</b><br>Defined   | Key fields coded to a local standard, reviewed on a schedule, documented, exchanged locally.       |
| <b>Level 4</b><br>Managed   | National or international coding, aligned with standard releases, published to users each version. |
| <b>Level 5</b><br>Optimized | Conforms to an international standard; versioned, machine-readable, combinable across borders.     |

**Your next step:** find the row for the level you reached, **then** read the row directly below it. That row is what you need to achieve to move up one level in this dimension.

**Note:** Every question in this dimension uses the same 1–5 scale, and the same real-world situation is worth the same number of points in every question, so both the lowest and the highest level are reachable. Transfer your maturity level for this dimension to the *Maturity Overall Score Calculation* sheet, which brings all ten dimensions together.

Question 1 follows the maturity levels of this dimension in the QUANTUM data holders' maturity model (Deliverable 1.2 v3.5); the wording is EHDS4ALL's own. Underlying source given there for this dimension: Adapted HDRUK / OMOP / OpenEHR / HL7 FHIR. Questions 2 to 5 are EHDS4ALL, developed from the WP3 workshop of August 2024 and the expert interviews of October 2024. The five level statements below combine all five questions, because the dimension score is the average of all five answers.

Jones, M., & Bernal-Delgado, E. (2025). **Deliverable 1.2 — Specification for the assessment of data holders' maturity** (Version 3.5.0). QUANTUM project. Zenodo. doi: 10.5281/zenodo.14944767

Gordon, B., Barrett, J., Fennessy, C., et al. (2021). Development of a data utility framework to support effective health data curation. *BMJ Health & Care Informatics*, 28(1), e100303.

Observational Health Data Sciences and Informatics (OHDSI). (n.d.). OMOP Common Data Model.

openEHR International. (n.d.). openEHR Architecture Specifications.

Health Level Seven International. (n.d.). FHIR Release 4 — Fast Healthcare Interoperability Resources.

EHDS4ALL (2024). Protocol, Workshop Kick-off WP3, Cologne, 19 August 2024. Work Package 3, dimension validation and maturity levels.

EHD54ALL (2024). Expert interviews with health data holders and maturity model developers, October 2024. Conducted by inav and the University of Cologne; participants anonymized.