

Automatic Conversion of Metadata from the Study of Health in Pomerania to ODM

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Introduction

The heterogeneity of medical data models hampers the interoperability of medical data.

- Medical data model: structured way to capture medical data
- Each medical institution comes up with their own data models

Proposed solutions:

1. Exchange and reuse of medical data models
2. Annotation with unique semantic identifiers

Metadata of Study of Health in Pomerania converted to ODM.
Annotate conversion results and make them publicly available.

Methods

Study of Health in Pomerania (SHIP) is a major population-based epidemiological study conducted by the University of Greifswald.

- Data from East Germany to explain higher mortality
- Two independent cohorts (SHIP in 1997, SHIP-TREND in 2003)
- In total over 500 questionnaires and 15.000 items
- More than 600 papers have been published

Metadata of the SHIP in self developed database schema.

- Special emphasize on data quality via logical constraints

Data Dictionary Tree		Stat	Name	Beschreibung
SHIP-0		●	ech_usnr	Untersuchernummer
SHIP-1		●	ech_beg	Beginn
SHIP-2		●	ech_grid	Geraete-ID
SHIP-3		●	ech_bsnr	Besonderheiten
SHIP-Trend		●	ech_note	Weitere Notizen
<ul style="list-style-type: none"> Persönliches Interview Medikamentenanamnese Zahnmedizinisches Interview Zahnmedizinische Untersuchung Medizinische Untersuchung <ul style="list-style-type: none"> Ultraschalluntersuchungen <ul style="list-style-type: none"> ECHO Herz - Allgemein ECHO Herz - Aortenklappenbe ECHO Herz - Mitralklappenbe Echo Leber Karotissonographie Karotis Plaques Schilddrüsensonographie Schilddrüsenknoten Physische Untersuchungen Biomaterialien Atemgasanalyse Laboruntersuchungen 		●	ech_lv	Aufnahme LV M-Mode
		●	ech_aola	Aufnahme AO M-Mode
		●	ech_akl	Aortenklappenbefund
		●	ech_mkl	Mitralklappenbefund
		●	ech_md	Mitralklappendoppler
		●	ech_mv	E/A Vasalva
		●	ech_pk	Pulmonalklappe
		●	ech_tk	Trikuspidalklappeninsuffizienz vorhanden?
		●	ech_tkq	Trikuspidalklappeninsuffizienz Quantifizierung
		●	ech_end	Ende

Variableninfo	
var_short	ech_pk
desc_long_de	Pulmonalklappe
desc_long_en	echo: pulmonary valve
Niveau	
nominal	
Auspraegungen (varvalue)	
gut schallbar (0.)	
schlecht schallbar (1.)	
nicht beurteilbar (8.)	
nicht geschallt (9.)	

Methods

Make export results available in Portal of Medical Data Models.

- Based on the CDISC ODM format
- More than 15 export formats (e.g. REDCap or FHIR)

ODM is an XML standard for metadata and clinical data

- Hierarchy: studyevents, forms, itemgroups, items and options
- Support for internationalization, range checks and measurement units
- ODM is part of the FDA's standard for new drug admissions

Results

Developed mapping from internal SHIP format to ODM XML:

- Element hierarchy of the SHIP was readily translated
- All internationalized texts adapted in the exported ODM files
- Different data types, apply most restrictive but still valid type
- Regular expression with a manual review to extract units
- Some logical constraints of the SHIP into ODM's range checks
- Remaining constraints as non-standardized formal expression

All original data was preserved (comment/description fields).

Results

The converted medical data model are reviewed on upload.

If mistakes in the export, update converter tool and rerun it.

- No information of the SHIP altered, only use original data
- Add improved export results as new versions into the portal

Annotation of exported data models with semantic identifiers.

- Preserve unique SHIP names for one-to-one correspondence
- Semantic code can be reused automatically
- Also possible to transfer codes back to the SHIP database

Persönliches Interview SHIP-Trend-1 Ergebnisrückmeldungen



Ergebnisrückmeldungen form of SHIP Study (Study of Health in Pomerania), conducted by the University of Greifswald. SHIP unique domain name TREND.TREND1.INT.DISCLOSED.KOGEN. ODM derived from https://www.fvcm.med.uni-greifswald.de/dd_service/data_use_explore.php. Further information: <http://www2.medizin.uni-greifswald.de/cm/fv/ship.html>. Publication granted by Prof. Völzke. Reference: Völzke H, et al. Cohort profile: the study of health in Pomerania. Int J Epidemiol. 2011;40(2):294-307. PMID: 20167617

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Keywords:

-  Kohortenstudien
-  Klinische Studie [Dokumenttyp]
-  Behandlungsergebnisbeurteilung (Gesundheitswesen)

Actions ▾

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Languages (1) ▾

Versions (3) ▾

Ergebnisrückmeldungen

Ergebnisrückmeldungen

Modul Anfangszeit endgültig

Modul Anfangszeit vorläufig

Modul Endzeit endgültig

Modul Endzeit vorläufig

Wurde Ihnen in der letzten SHIP-Untersuchung empfohlen, eine der folgenden Untersuchungsergebnisse ärztlich abklären zu lassen, auch wenn Ihnen diese bereits bekannt waren oder sie sich nicht ärztlich bestätigt hatten? (Arterienverweiterung(Aneurysma))

Wie beurteilen Sie das Ergebnis dieser Behandlung?

- sehr schädlich
- schädlich
- etwas schädlich
- weder noch
- etwas erfolgreich
- erfolgreich

There are 4 more items that can be looked at in the detailed view

War Ihnen das Untersuchungsergebnis Karies, Parodontitis bereits vor der SHIP-Untersuchung bekannt?

- Nein
- Ja
- Weiß nicht
- Antwortverweigerung

Persönliches Interview SHIP-Trend-1 Ergebnisrückmeldungen



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[Versions \(3\) ▾](#)

TREND.TREND1.INT.DISCLOSED.KOGN

Ergebnisrückmeldungen

Ergebnisrückmeldungen

Name: Ergebnisrückmeldungen
Description: Ergebnisrückmeldungen

Name	Start date and time
Question	Modul Anfangszeit endgültig
Datatype	datetime
Aliases:	
UMLS CUI [1]	C3897500
Name	Start date and time
Question	Modul Anfangszeit vorläufig
Datatype	datetime
Aliases:	
UMLS CUI [1]	C3897500
Name	End date and time
Question	Modul Endzeit endgültig
Datatype	datetime

Discussion

SHIP questionnaires were successfully converted to ODM

- Limitations: logical constraints, data types and units
- Possibility to improve/adapt the conversion tool in the future
- Over 500 SHIP questionnaires will be available in the Portal of Medical Data Models with 15 different export formats
- SHIP questionnaires will be semantically annotated
- Facilitates the implementation at different study sites
- Allows to reuse medical data models that cover a broad medical spectrum