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A cookbook for estimating treatment duration from databases in pharmacoepidemiologic studies

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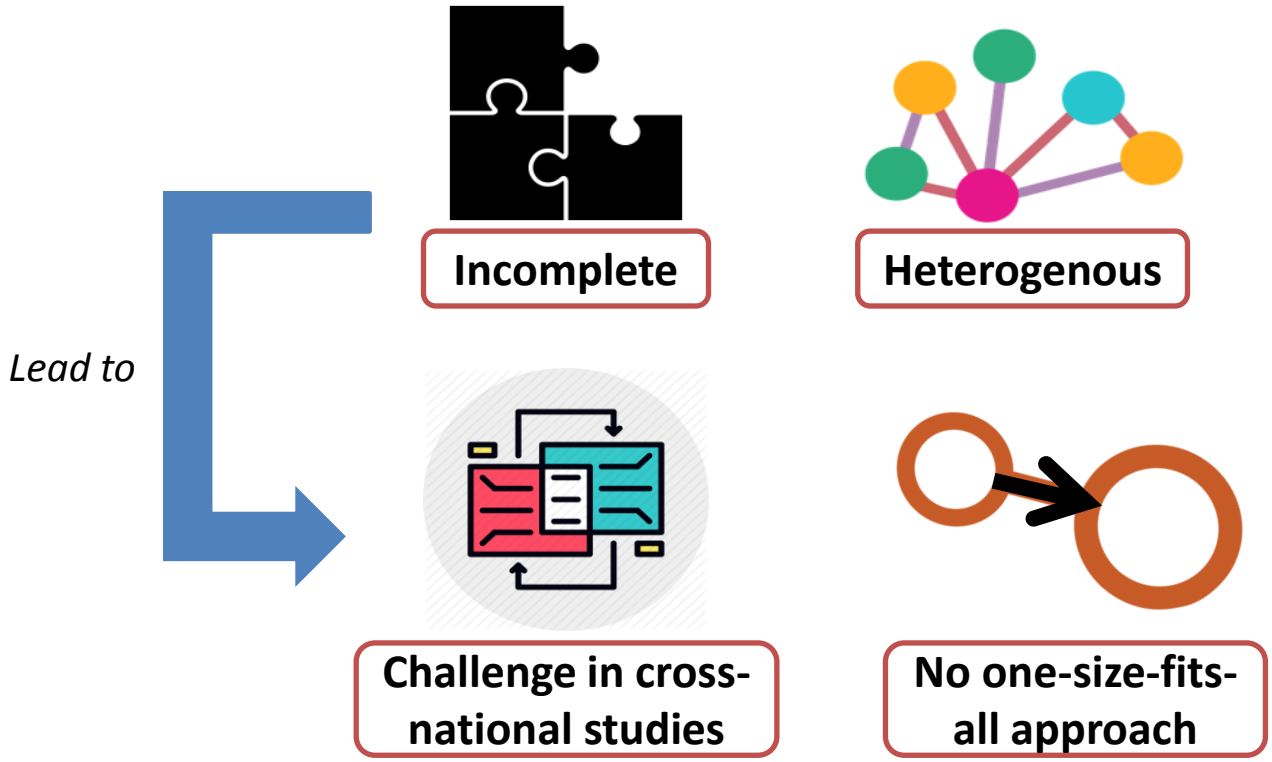
Background

When conducting **cross-national drug utilization studies**, there is **missing data** to estimate in an homogeneous and confident way a treatment duration.

The **number of days** of theoretical duration **of the exposure** to a box or set of boxes (or NoDT) of a certain prescription/dispensation is **rarely captured** in electronic health data (EHD).



Aims

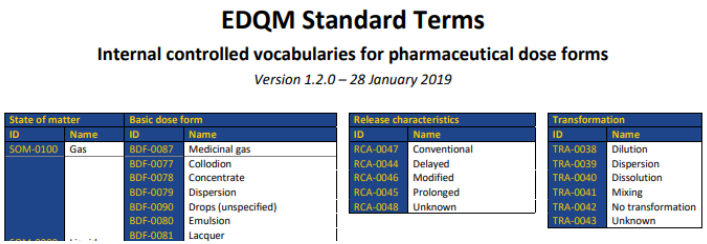
1. **Identify a set of standard** terms and variables needed when calculating NoDT across 7 different EHD from 5 countries.

> ***EUPAS31095:*** *Impact of EU label changes and revised pregnancy prevention programme for oral retinoid containing medicinal products: utilization and prescribing trends*

2. **Develop a cookbook of recipes** that is applicable to European data sources in the Retinoids study.

Methods

1. **Review** of Guidelines of European standard terms for medicines.



EDQM Standard Terms

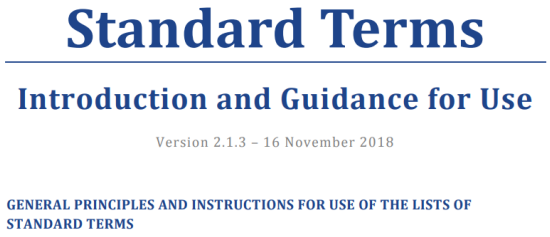
Internal controlled vocabularies for pharmaceutical dose forms

Version 1.2.0 – 28 January 2019

State of matter		Basic dose form	
ID	Name	ID	Name
SOM-0100	Gas	BDF-0087	Medicinal gas
		BDF-0077	Collodion
		BDF-0078	Concentrate
		BDF-0079	Dispersion
		BDF-0090	Drops (unspecified)
		BDF-0080	Emulsion
		BDF-0081	Lacquer

Release characteristics	
ID	Name
RCA-0047	Conventional
RCA-0044	Delayed
RCA-0046	Modified
RCA-0045	Prolonged
RCA-0048	Unknown

Transformation	
ID	Name
TRA-0038	Dilution
TRA-0039	Dispersion
TRA-0040	Dissolution
TRA-0041	Mixing
TRA-0042	No transformation
TRA-0043	Unknown



Standard Terms

Introduction and Guidance for Use

Version 2.1.3 – 16 November 2018

GENERAL PRINCIPLES AND INSTRUCTIONS FOR USE OF THE LISTS OF STANDARD TERMS

WHO Collaborating Centre for Drug Statistics Methodology

News

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2. **Formulate** a **list of concepts** to describe medicine and product information, and standard vocabularies which can be used to generate a cookbook of recipes that is applicable to European data sources in the Retinoids study.

Results: concept list

Variable	Description
MEDICINES TABLE	
person_id	Foreign key. Unique person identifier.
medicinal_product_id	Foreign key. Unique identifier of a specific medicinal product.
medicinal_product_atc_code	ATC code of the medicinal product.
date_dispensing	Date when the medicinal product was dispensed.
date_prescription	Date when the medicinal product was prescribed.
disp_number_medicinal_product	Number of dispensed units of medicinal_product_id.
presc_quantity_per_day	Prescribed quantity of medicinal product to be taken daily.
presc_quantity_units*	Unit of measure of the prescribed daily quantity.
presc_duration_days	Number of days of medication as prescribed.
product_lot_number	An identifier assigned to a lot of medicinal product from the manufacturer.
indication_code	Single identifier of a condition for which the medicinal product relates.
indication_code_vocabulary*	Coding system referring to indication code
meaning_of_drug_record*	Relevant information with respect to the interpretation of this record. It may capture the prompt, or specificities of the content, from the source of this record.
origin_of_drug_record*	Name of the source table for each record.
prescriber_speciality*	Profile of the healthcare professional.
visit_occurrence_id	Identifier of the prescription indicating the visit where the drug was prescribed or dispensed.

Variable	Description
PRODUCTS TABLE	
medicinal_product_id	Foreign key. Unique identifier of a specific medicinal product.
medicinal_product_name	Authorization name of any substance or combination of substances.
unit_of_presentation_type*	Qualitative term describing the discrete countable entity in which a pharmaceutical product or manufactured item is presented.
unit_of presentation_num	Number of unit of presentation type within a medicinal product.
administration_dose_form*	Pharmaceutical dose form for administration to the patient.
administration_route*	Route of administration of the pharmaceutical product.
medicinal_product_atc_code	ATC code of the medicinal product.
subst1_atc_code	ATC code of the medicinal product of an active principle.
…	
subst1_amount_per_form	Quantity of the first active principle contained in the medicinal product
…	
subst1_amount_unit*	Unit of measure of the quantity of the first active principle.
…	
subst1_concentration	Strength or quantity contained into a single unit of presentation or dose form.
…	
subst1_concentration_unit*	Unit of measure of the strength or quantity.
…	
concentration_total_content	Total content of a single unit such as particular type of pharmaceutical unit of presentation or dose form.
concentration_total_content_unit*	Unit of measure of the concentration total content.
medicinal_product_manufacturer	Name of the manufactured of the pharmaceutical product.

Results: Example recipes

Recipe	Recipe formula	Human translation	Output	Example for 1 box dispensed	
1 †	disp_num_medicinal_product * unit_of_presentation_num / presc_quantity_per_day	Number of boxes dispensed of the medicinal product * Number of units within a box / Number of units to be taken daily	NDOT	ACITRETIN IFC EFG 30 CAPSULES of 10 mg (twice daily)	1 * 30 / 2 = 15 days
2 ‡	disp_num_medicinal_product * subst_amount_per_form * unit_of_presentation_num / dd	Number of boxes dispensed of the medicinal product * Quantity of the active principle per form * Number of units within a box / Quantity of medicinal product to be taken daily	NDOT	ACITRETIN IFC EFG 30 CAPSULES of 10 mg (twice daily)	1 * 10 (mg) * 30 / 20 (mg) = 15 days
				ACITRETIN IFC EFG 30 CAPSULES of 10 mg (DDD)	1 * 10 (mg) * 30 / 35 (mg) = 8.6 days
[…]					

† A check will be needed to examine whether the units are consistent.

‡ If there is more than one active principle within a medicinal product, the first one can be used.

Conclusions

- There is **heterogeneity** in the information required to estimate NoDT which may lead to biases due to the definition of exposure when cross-national studies are performed.
- A set of **theoretical algorithms** (or "recipes") that could be used to combine component information to calculate or estimate the NoDT in an individual prescription or dispensing has been **derived**.
- An **automatic function is being developed** and will be refined to account for more casuistry.

Let me acknowledge all the work of **Nicolas** H. Thurin, **Giuseppe** Roberto, **Patrick** Souverein, **Rosa** Gini, and **Romin** Pajouheshnia, both in the development of the project and the contribution to my participation in the EACPT conference.

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Thank you for attending! Questions?

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