WHO Drug Dictionary

Magnus Wallberg

Dar Es Salaam, Tanzania
November 24th, 2009

magnus.wallberg@who-umc.org
General information

- The WHO Drug Dictionary contains data from 1968 onwards
- The content today is originating mostly from IMS and National Drug names References
- No entries are deleted even though they are withdrawn from the market, since old case reports might be coded with these products.
  - They are marked as OLD FORM
Drug/Medicinal Product Classification

• Structure
  - to allow easy and flexible data retrieval
  - and analysis

• Classifications
  - Chemical
  - Indication

• Hierarchical
  - to allow different levels of precision
  - to facilitate navigation and aggregation

• Up to date

Magnus Wallberg, UMC
The WHO Drug Dictionary (WHO-DD)

• A database with information about medicinal products from all over the world
  - it contains medicinal products and information related to them in a relational database system

• Information is provided in a consistent and structured way

• It provides useful groupings of data
  - useful for both data input and output

• It is continuously updated

Magnus Wallberg, UMC
The WHO-DD

- **A source of international drug names**
- Substance names according to International Non Proprietary Names (INN)
- Drugs classified according to the Anatomical-Therapeutic-Chemical (ATC) classifications system
- Information on companies and reference sources
Medicinal product names

- **Proprietary names**
  - single-ingredient
  - multiple-ingredient

- **Nonproprietary/ Generic names**
  - single-ingredient
  - multiple-ingredient
Preferred name

• Single ingredient drugs
  – Nonproprietary names

• Multiple ingredient drugs
  – Trade names
    • First reported brand of a given ingredient combination
  – Nonproprietary names
Types of medicinal products in WHO-DD

- The majority of the entries refer to conventional (chemical substance) medicinal products but the WHO-DD also includes
  - herbal remedies
  - vaccine
  - blood products
  - homeopathic remedy
  - dietary supplement

Magnus Wallberg, UMC
Codes and IDs

• Link products with the same ingredients
  - generics – brands

Particularly important for international exchange of information, since there are different product names in different countries

• Link products containing the same base ingredient, but different salt/esters
Codes and IDs

• Drug Code identifies
  – Ingredient(s)
    • Salts/Esters
      – Names

Aspirin – 000027 01 004
Magnecyl – 000027 01 006

• Medicinal Product ID identifies a unique entry
  – a numeric name.
How do we use WHO-DD

- Those who report ICSRs to the UMC need to give the product name and when needed the National product name compendia
- The reported medicinal product is linked to the WHO-DD which contains more information on the product

VigiBase
ICSR database

<table>
<thead>
<tr>
<th>ICSR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient data</td>
</tr>
<tr>
<td>Reaction data</td>
</tr>
<tr>
<td>Medication data</td>
</tr>
<tr>
<td>Vioxx 5 mg d</td>
</tr>
<tr>
<td>More data...</td>
</tr>
</tbody>
</table>

WHO-DD

Vioxx 5 mg tablet
Merck, Sweden
ATC code: M01AH
Ingr.: rofecoxib
With the WHO-DD linked to ICSRs we can

- Sort
- Group
- Search

ICSRs according to:

- product name
- ingredients
- therapeutic group etc.

Magnus Wallberg, UMC
**An example**

<table>
<thead>
<tr>
<th>Ingredient / Base</th>
<th>Salt/ Ester</th>
<th>Brand name</th>
<th>Medicinal product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paracetamol</td>
<td>-</td>
<td>Alvedon</td>
<td>500 mg Tablets</td>
</tr>
<tr>
<td>Paracetamol</td>
<td>-</td>
<td>Alvedon</td>
<td>Fluid</td>
</tr>
<tr>
<td>Paracetamol</td>
<td>-</td>
<td>Acetamol</td>
<td>Tablets</td>
</tr>
<tr>
<td>Paracetamol sodium</td>
<td>Paracetamol</td>
<td>Acetasod</td>
<td>Intravenous</td>
</tr>
<tr>
<td>Paracetamol</td>
<td>Paracetamol hydrochloride</td>
<td>Acecloride</td>
<td>Unspecified</td>
</tr>
</tbody>
</table>

1 – Search on medicinal product level
2 – Search on brand name level
3 – Search on Salt/Ester level
4 – Search on base ingredient level

Magnus Wallberg, UMC
ATC in WHO Drug Dictionary

ATC Classification Index

- issued by the WHO Collaborating Centre, Oslo, Norway
ATC in WHO Drug Dictionary

• Help for drug utilisation research
• Hierarchical classification useful for navigation and aggregation
• Applicable to both single and multiple ingredient drugs
• Medicinal products are classified according to the main therapeutic use
• Revised yearly

Magnus Wallberg, UMC
ATC in WHO Drug Dictionary

- Medicine
- Chemical drug
- CNS drug
- Sedative
- Benzodiazepine
  - Diazepam
  - Valium
    - Valium tablet
    - Valium 10mg tablet

- Report entry

N05BA - Benzodiazepine derivatives

Anatomical level
 Therapeutic level
 Chemical level
 Generic level (ingredient/s)
 Proprietary name level

Magnus Wallberg, UMC
### ATC Classification Main Groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>ALIMENTARY TRACT AND METABOLISM</td>
</tr>
<tr>
<td>B</td>
<td>BLOOD AND BLOOD FORMING ORGANS</td>
</tr>
<tr>
<td>C</td>
<td>CARDIOVASCULAR SYSTEM</td>
</tr>
<tr>
<td>D</td>
<td>DERMATOLOGICALS</td>
</tr>
<tr>
<td>G</td>
<td>GENITO URINARY SYSTEM AND SEX HORMONES</td>
</tr>
<tr>
<td>H</td>
<td>SYSTEMIC HORMONAL PREPARATIONS, EXCL. SEX HORMONES AND INSULIN</td>
</tr>
<tr>
<td>J</td>
<td>ANTIINFECTIVES FOR SYSTEMIC USE</td>
</tr>
<tr>
<td>L</td>
<td>ANTINEOPLASTIC AND IMMUNOMODULATING AGENTS</td>
</tr>
<tr>
<td>M</td>
<td>MUSCULO-SKELETAL SYSTEM</td>
</tr>
<tr>
<td>N</td>
<td>NERVOUS SYSTEM</td>
</tr>
<tr>
<td>P</td>
<td>ANTIPARASITIC PRODUCTS, INSECTICIDES AND REPELLENTS</td>
</tr>
<tr>
<td>R</td>
<td>RESPIRATORY SYSTEM</td>
</tr>
<tr>
<td>S</td>
<td>SENSORY ORGANS</td>
</tr>
<tr>
<td>V</td>
<td>VARIOUS</td>
</tr>
</tbody>
</table>

Screen shot from DD Browser
An example

<table>
<thead>
<tr>
<th>Ingredient / Base</th>
<th>Salt/ Ester</th>
<th>Brand name</th>
<th>Medicinal product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paracetamol</td>
<td>-</td>
<td>Alvedon</td>
<td>500 mg Tablets</td>
</tr>
<tr>
<td>Paracetamol</td>
<td>-</td>
<td>Alvedon</td>
<td>Fluid</td>
</tr>
<tr>
<td>Paracetamol</td>
<td>-</td>
<td>Acetamol</td>
<td>Tablets</td>
</tr>
<tr>
<td>Paracetamol</td>
<td>Paracetamol sodium</td>
<td>Acetasod</td>
<td>Intravenous</td>
</tr>
<tr>
<td>Paracetamol</td>
<td>Paracetamol hydrochloride</td>
<td>Acecloride</td>
<td>Unspecified</td>
</tr>
</tbody>
</table>

1 – Search on medicinal product level  
2 – Search on brand name level  
3 – Search on Salt/Ester level  
4 – Search on base ingredient level  

Magnus Wallberg, UMC
## An example

<table>
<thead>
<tr>
<th>Ingredient / Base</th>
<th>Salt/ Ester</th>
<th>Brand name</th>
<th>Medicinal product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paracetamol</td>
<td>-</td>
<td>Alvedon</td>
<td>500 mg Tablets</td>
</tr>
<tr>
<td>Paracetamol</td>
<td>-</td>
<td>Alvedon</td>
<td>Fluid</td>
</tr>
<tr>
<td>Paracetamol</td>
<td>-</td>
<td>Acetamol</td>
<td>Tablets</td>
</tr>
<tr>
<td>Paracetamol</td>
<td>Paracetamol sodium</td>
<td>Acetasod</td>
<td>Intravenous</td>
</tr>
<tr>
<td>Paracetamol</td>
<td>Paracetamol hydrochloride</td>
<td>Acecloride</td>
<td>Unspecified</td>
</tr>
<tr>
<td>Acetylsalicylic acid</td>
<td>-</td>
<td>Aspirin</td>
<td>Tablets</td>
</tr>
</tbody>
</table>

Magnus Wallberg, UMC
<table>
<thead>
<tr>
<th>ATC code</th>
<th>Ingredient / Base</th>
</tr>
</thead>
<tbody>
<tr>
<td>N02BE</td>
<td>Paracetamol</td>
</tr>
<tr>
<td>N02BE</td>
<td>Paracetamol</td>
</tr>
<tr>
<td>N02BE</td>
<td>Paracetamol</td>
</tr>
<tr>
<td>N02BE</td>
<td>Paracetamol</td>
</tr>
<tr>
<td>N02BE</td>
<td>Paracetamol</td>
</tr>
<tr>
<td>N02BA</td>
<td>Acetylsalicylic acid</td>
</tr>
</tbody>
</table>

M : MUSCULO-SKELETAL SYSTEM - [add to search]
N : NERVOUS SYSTEM - [add to search]
N01 : ANESTHETICS - [add to search]
N02 : ANALGESICS - [add to search]
N02A : OPIOIDS - [add to search]
N02B : OTHER ANALGESICS AND ANTIPYRETICS - [add to search]
N02BA : Salicylic acid and derivatives - [add to search]
N02BB : Pyrazolones - [add to search]
N02BE : Anilides - [add to search]
N02BG : Other analgesics and antipyretics - [add to search]
N02BW : Herbal analgesics and antipyretics containing alkaloids - [add to search]
N02C : ANTIMIGRAINE PREPARATIONS - [add to search]
N03 : ANTI-EPILEPTICS - [add to search]
N04 : ANTI-PARKINSON DRUGS - [add to search]
N05 : PSYCHOLEPTICS - [add to search]
N06 : PSYCHOANALEPTICS - [add to search]
N07 : OTHER NERVOUS SYSTEM DRUGS - [add to search]
P : ANTIPARASITIC PRODUCTS, INSECTICIDES AND REPELLENTS - [add to search]
Access to the WHO-DD

Magnus Wallberg, UMC
How to access the WHO-DD

WHO-DD is available in several ways

• As textfiles to download and load in local tools
  – Requires in-depth technical knowledge of the WHO DD structure

• Via online tools:
  – Integrated in VigiSearch
  – Integrated in VigiFlow
  – WHO DD browser

• The methods for access is somewhat different depending on the needs for each specific tool

Magnus Wallberg, UMC
WHO Drug Dictionary - VigiSearch

- The WHO Drug Dictionary is available via VigiSearch
  - Only medicinal products reported on ICSRs available

- VigiSearch is up to date with all medicinal products occurring on the reports within VigiBase
  - Updated together with the data in VigiSearch on a monthly basis
WHO Drug Dictionary - VigiSearch

Dataset date: 2009-10-27
Total number of reports: 4909264

Drugs included in search
- Drug
- ATC
- Preferred base
- Preferred salt
- Date (ccyy mm dd)

Reactions included in search
- PT
- Begin with

Terminology
- WHO-ART

Advanced view

Magnus Wallberg, UMC
WHO Drug Dictionary - VigiSearch

Dataset date: 2009-10-27
Total number of reports: 4909264

Drugs included in search:
- Drug
- ATC
- Preferred base
- Preferred salt
- Paracetamol
- Alvedon
- DRUG

Add selected

Reactions included in search:
- PT

Received date:
- from date
- to date

Advanced view

Magnus Wallberg, UMC
You are now ready to perform a search based on your selection.

Magnus Wallberg, UMC
WHO Drug Dictionary - VigiFlow

- The WHO Drug Dictionary is available via VigiFlow
  - Amount of data depends on agreement with National Authority

- VigiFlow is up to date with the latest WHO Drug Dictionary content
  - Usually updated with new entries once per week
# Search for drug

<table>
<thead>
<tr>
<th>Field</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>drug name</td>
<td>Begins with, Equals</td>
</tr>
<tr>
<td>substance</td>
<td>Begins with, Contains</td>
</tr>
<tr>
<td>MA holder</td>
<td>Contains</td>
</tr>
<tr>
<td>country</td>
<td>Include unspec., Include unspec., Country spec.</td>
</tr>
<tr>
<td>ATC code</td>
<td>Pick ATC code</td>
</tr>
</tbody>
</table>

**Find a drug**

Use the search options to find a drug from the WHO Drug Dictionary. If not the specific MA holder/country/form/strength can be found by clicking on the plus sign, it is possible to add the drug at a higher, less specified level.

If no matching drug exists, it is possible to suggest a new drug to be added to the WHO Drug Dictionary:

**suggest new drug**
Browse for ATC code

- A : ALIMENTARY TRACT AND METABOLISM - add to search
- B : BLOOD AND BLOOD FORMING ORGANS - add to search
- C : CARDIOVASCULAR SYSTEM - add to search
- D : DERMATOLOGICALS - add to search
- G : GENITO URINARY SYSTEM AND SEX HORMONES - add to search
- H : SYSTEMIC HORMONAL PREP.,EXCL.SEX HORM.AND INSULIN - add to search
- J : ANTIINFECTIVES FOR SYSTEMIC USE - add to search
  - J01 : ANTIBACTERIALS FOR SYSTEMIC USE - add to search
  - J02 : ANTIMYCOTICS FOR SYSTEMIC USE - add to search
  - J04 : ANTIMYCOBACTERIALS - add to search
  - J05 : ANTIVIRALS FOR SYSTEMIC USE - add to search
    - J05A : DIRECT ACTING ANTIVIRALS - add to search
      - J05AA : Thiosemicarbazones - add to search
      - J05AB : Nucleosides and nucleotides excl rev.transcr.inhib - add to search
      - J05AC : Cyclic amines - add to search
      - J05AD : Phosphonic acid derivaties - add to search
      - J05AE : Protease inhibitors - add to search
      - J05AF : Nucleoside reverse transcriptase inhibitors - add to search
      - J05AG : Non-nucleoside reverse transcriptase inhibitors - add to search
      - J05AH : Neuraminidase inhibitors - add to search
      - J05AX : Other antivirals - add to search
  - J06 : IMMUNE SERA AND IMMUNOGLOBULINS - add to search
  - J07 : VACCINES - add to search
- L : ANTINEOPLASTIC AND IMMUNOMODULATING AGENTS - add to search
- M : MUSCULO-SKELETAL SYSTEM - add to search
- N : NERVOUS SYSTEM - add to search
- P : ANTI PARASITIC PRODUCTS, INSECTICIDES AND REPELLENTS - add to search
- R : RESPIRATORY SYSTEM - add to search
- S : SENSORY ORGANS - add to search
- V : VARIOUS - add to search

back

Magnus Wallberg, UMC
This is the level to select when you only know the tradename of the drug (or the substance).

Magnus Wallberg, UMC
Select this level when you know the tradename of the drug as well as manufacturer and/or country.

Magnus Wallberg, UMC
Select this level when you know the tradename, ma-holder, country as well as form and/or strength.
WHO Drug Dictionary – DD Browser

• The DD Browser is a web based tool primarily designed for the purpose of searching the WHO-DD
  – Unlike the browsers in VigiFlow and VigiSearch where they are integrated in the tools
• Provides a more powerful and flexible way of searching and looking at the data
• Here are a few screenshots but the DD Browser tool will not be presented in detail...

Magnus Wallberg, UMC
Example illustrating the search of single ingredient
Example illustrating the search of single ingredient

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Drug Code</th>
<th>Ingredient(s)</th>
<th>Generic</th>
<th>Preferred</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ampicillin</td>
<td>00000501001</td>
<td>Ampicillin</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Ampicillin</td>
<td>00000502017</td>
<td>Ampicillin sodium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ampicillin</td>
<td>00000503028</td>
<td>Ampicillin trihydrate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ampicillin</td>
<td>00000504005</td>
<td>Ampicillin potassium</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Example illustrating the search of single ingredients**

<table>
<thead>
<tr>
<th>Product Name:</th>
<th>Ampicillin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicinal Product ID:</td>
<td>143</td>
</tr>
<tr>
<td>Drug Code:</td>
<td>00000501001</td>
</tr>
<tr>
<td>Preferred base name:</td>
<td>Ampicillin</td>
</tr>
<tr>
<td>Preferred salt name:</td>
<td></td>
</tr>
<tr>
<td>Product type:</td>
<td>Medicinal product</td>
</tr>
<tr>
<td>Generic/Preferred:</td>
<td>Generic/Preferred</td>
</tr>
<tr>
<td>Pharmaceutical Form:</td>
<td>Unspecified</td>
</tr>
<tr>
<td>Strength:</td>
<td>Unspecified</td>
</tr>
<tr>
<td>Active Ingredient(s):</td>
<td>Ampicillin</td>
</tr>
<tr>
<td>Country:</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>MAH:</td>
<td>None</td>
</tr>
<tr>
<td>Company:</td>
<td>None</td>
</tr>
<tr>
<td>Name source:</td>
<td>INN - International Nonproprietary Names - WHO</td>
</tr>
<tr>
<td>ATC code(s):</td>
<td>S01AA Antibiotics official</td>
</tr>
<tr>
<td></td>
<td>J01CA Penicillins with extended spectrum official</td>
</tr>
</tbody>
</table>