



# Introduction to ATC Methodology

**Ignatios Ioakeim Skoufa, MD**

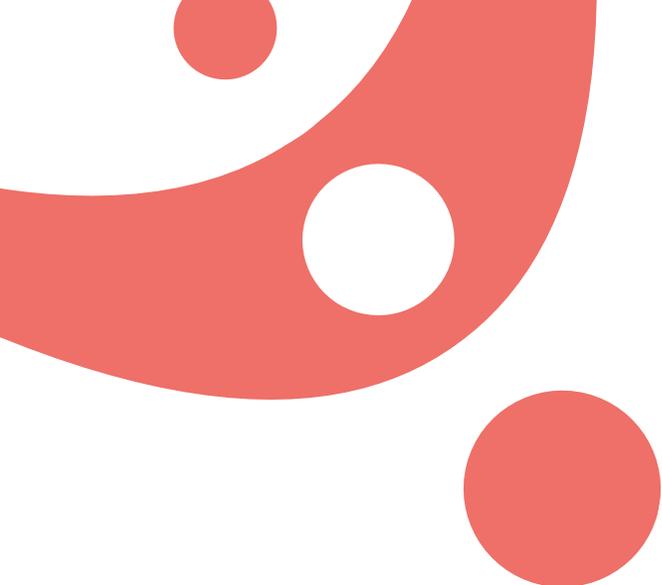
WHO Collaborating Center for Drug Statistics Methodology

3 April 2025, the Institute of Public Health, Chile

# ATC/DDD Methodology

## Part I: Introduction to ATC

- Historical background
- The ATC system
- Implementing the methodology
- Using the methodology



# Historical background

The need for a “common language”

The two components of the system

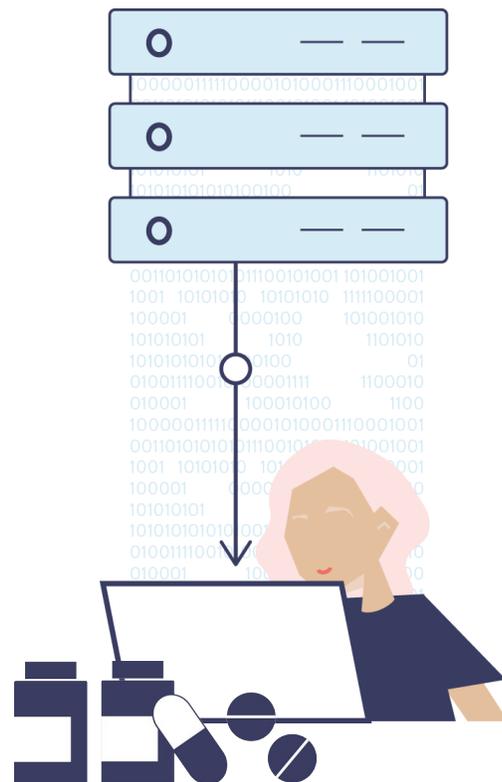
# The need for a “common language”

## Milestones and key developments

- 1960s      Thalidomide disaster. Need for drug monitoring and cross-country comparisons
- 1967        Need for a standardised way to express drug consumption volume
- 1969        Need for an internationally accepted drug classification
- 1970s       Development of a classification system with a unit of measurement

# The two components of the system

ATC and DDD



A classification system



A unit of measurement



# The ATC system

Structure of the ATC system

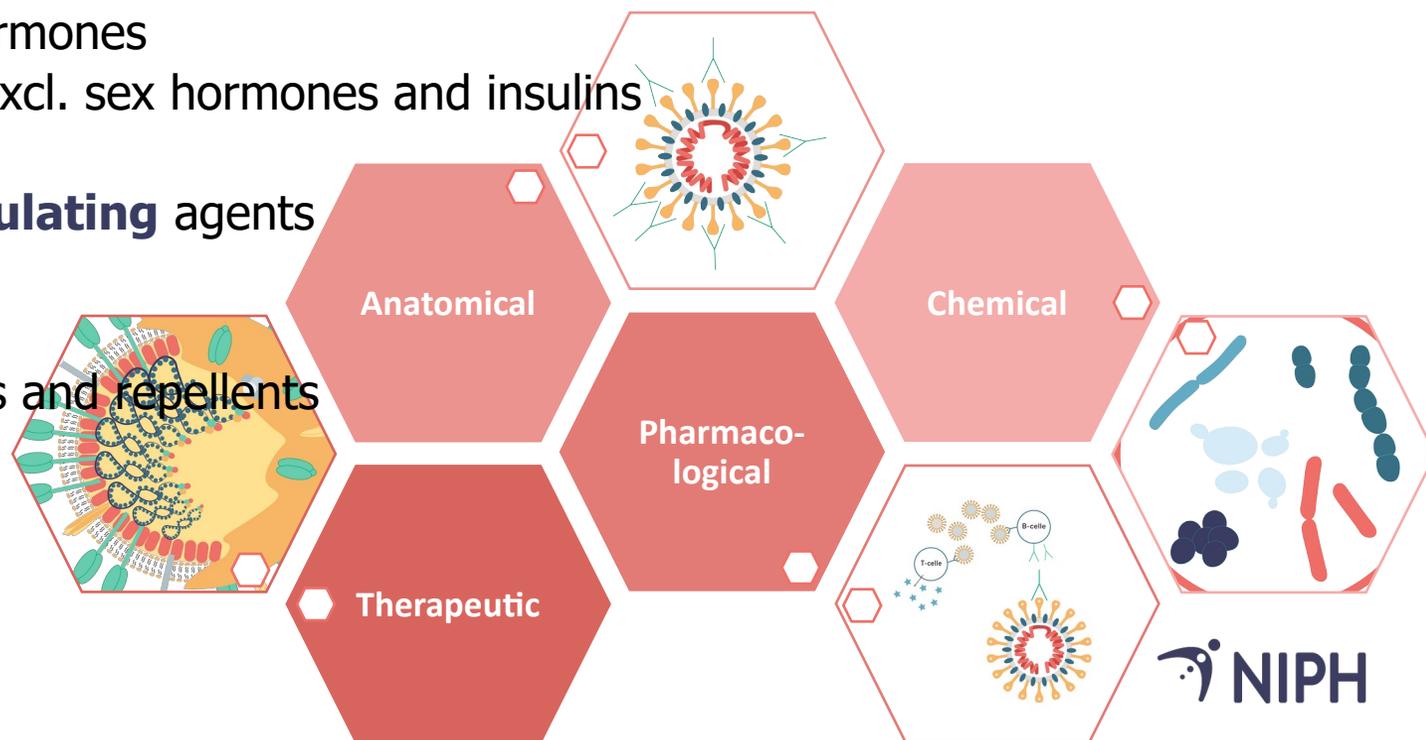
General principles for ATC classification



# Structure of the ATC system

## Hierarchical classification

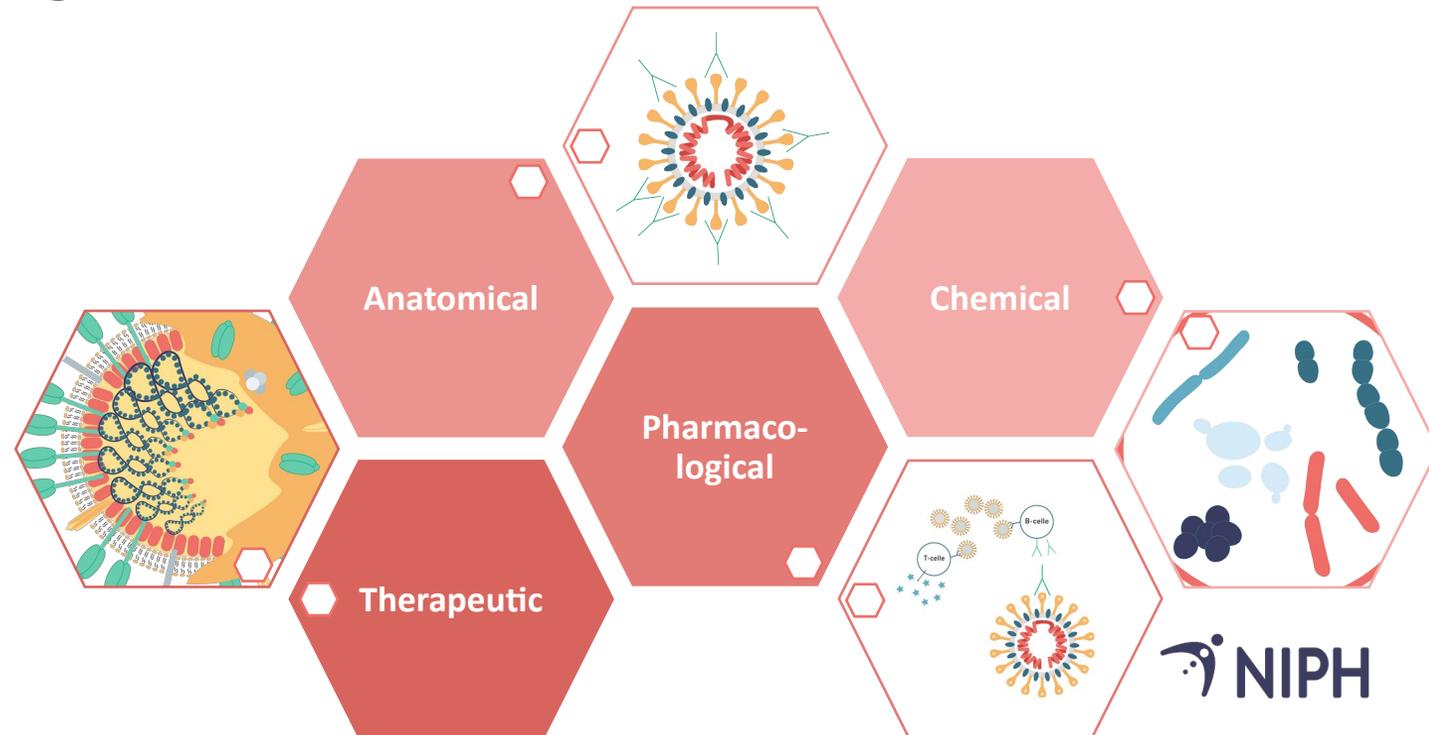
- A** **A**limentary tract and **metabolism**
- B** **B**lood and blood forming organs
- C** **C**ardiovascular system
- D** **D**ermatologicals
- G** **G**enito urinary system and sex hormones
- H** Systemic **h**ormonal preparations, excl. sex hormones and insulins
- J** **A**nti**i**nfectives for systemic use
- L** **A**nti**e**oplasti**c** and **i**mmunomodulating agents
- M** **M**usculo-skeletal system
- N** **N**ervous system
- P** **A**nti**p**arasitic products, insecticides and repellents
- R** **R**espiratory system
- S** **S**ensory organs
- V** **V**arious



# Structure of the ATC system

## Hierarchical classification

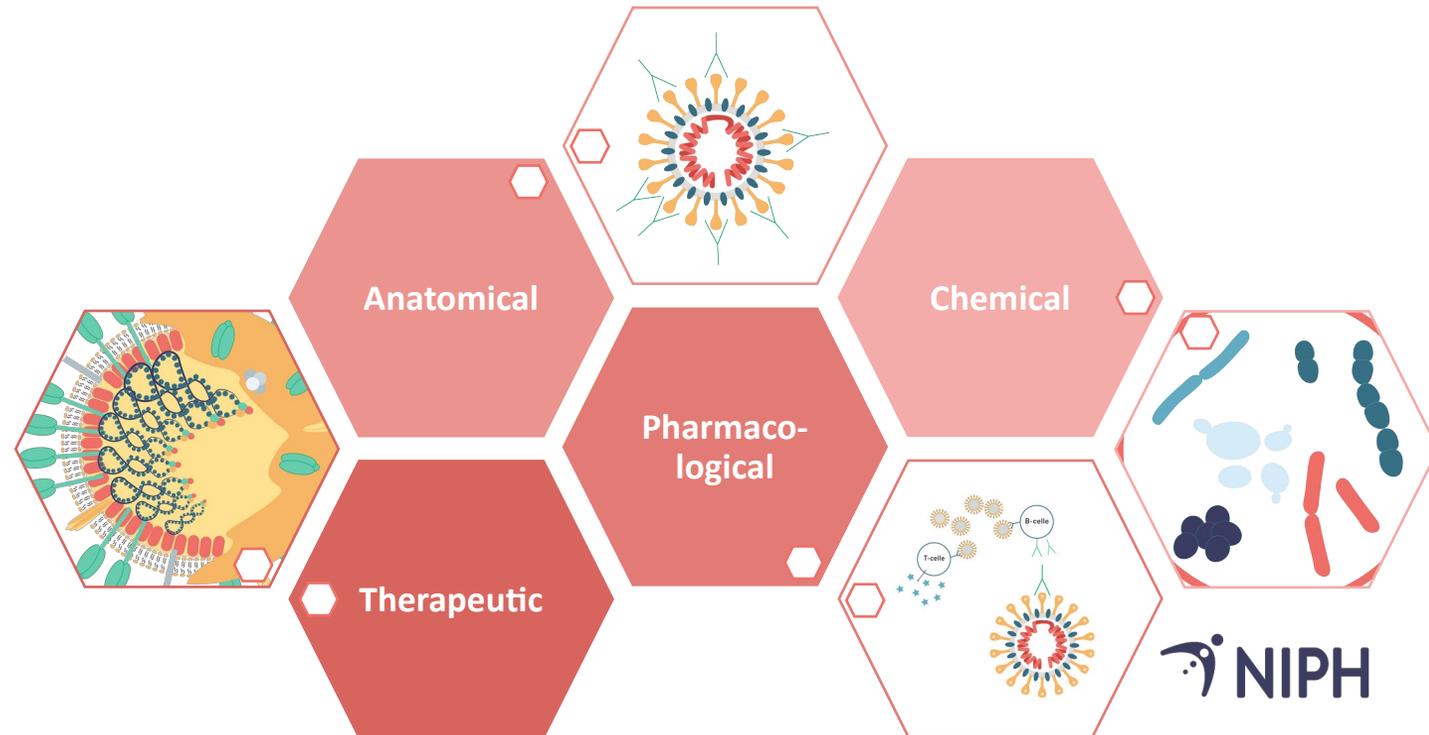
A	Alimentary tract and metabolism
A10	Drugs used in diabetes
A10B	Blood glucose lowering drugs, excl. insulins
A10BA	Biguanides
A10BA02	metformin



# Structure of the ATC system

## Hierarchical classification

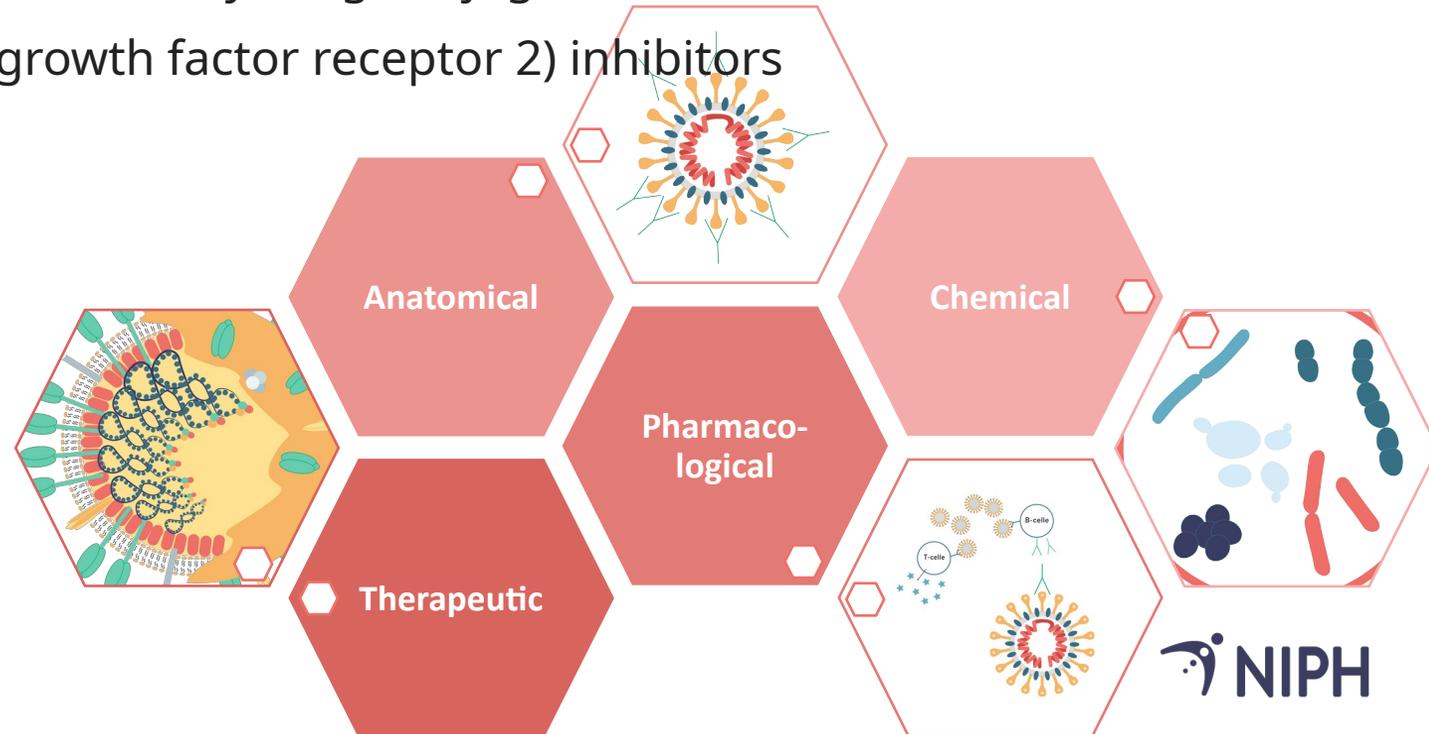
C	Cardiovascular system
C09	Agents acting on the renin-angiotensin system
C09A	ACE inhibitors, plain
C09AA	ACE inhibitors, plain
C09AA01	captopril



# Structure of the ATC system

## Hierarchical classification

L	Antineoplastic and immunomodulating agents
L01	Antineoplastic agents
L01F	Monoclonal antibodies and antibody drug conjugates
L01FD	HER2 (Human epidermal growth factor receptor 2) inhibitors
L01FD01	trastuzumab



# Structure of the ATC system

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## International language for drug utilization research



The Anatomical Therapeutic Chemical (ATC) classification system and the Defined Daily Dose (DDD) as a measuring unit have become the gold standard for international drug utilization monitoring and research.

The ATC/DDD system is a tool for exchanging and comparing data on drug use at international, national or local levels.

## Welcome to the WHO Collaborating Centre for Drug Statistics Methodology

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Temporary ATC/DDDs including alterations from the October 2024 meeting

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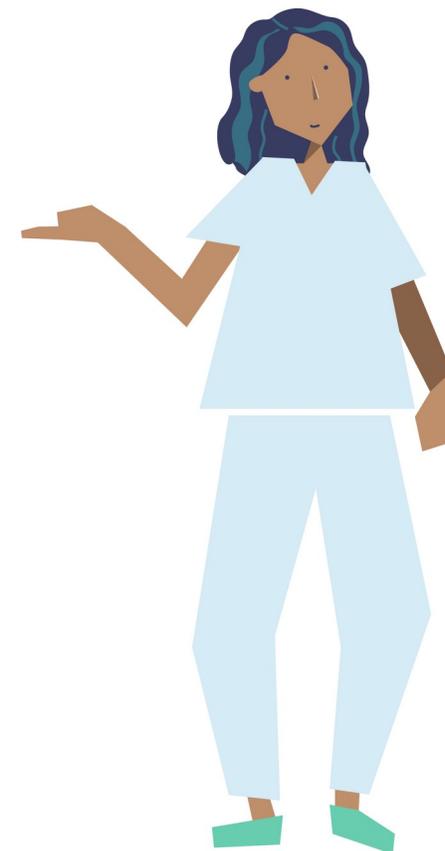
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## ATC/DDD Index 2025

A searchable version of the complete ATC index with DDDs is available below. The search options enable you to find ATC codes and DDDs for substance name and/or ATC levels. In your search result you may choose to show or hide the text from the Guidelines for ATC classification and DDD assignment linked to the ATC level. The text in the Guidelines will give information related to the background for the ATC and DDD assignment.

### Search query

or

### ATC code

- All ATC levels are searchable.
- A search will result in showing the exact substance/level and all ATC levels above (up to 1st ATC level).

A [ALIMENTARY TRACT AND METABOLISM](#)

B [BLOOD AND BLOOD FORMING ORGANS](#)

C [CARDIOVASCULAR SYSTEM](#)

D [DERMATOLOGICALS](#)

G [GENITO URINARY SYSTEM AND SEX HORMONES](#)

H [SYSTEMIC HORMONAL PREPARATIONS, EXCL. SEX HORMONES AND INSULINS](#)

J [ANTIINFECTIVES FOR SYSTEMIC USE](#)

L [ANTINEOPLASTIC AND IMMUNOMODULATING AGENTS](#)

M [MUSCULO-SKELETAL SYSTEM](#)

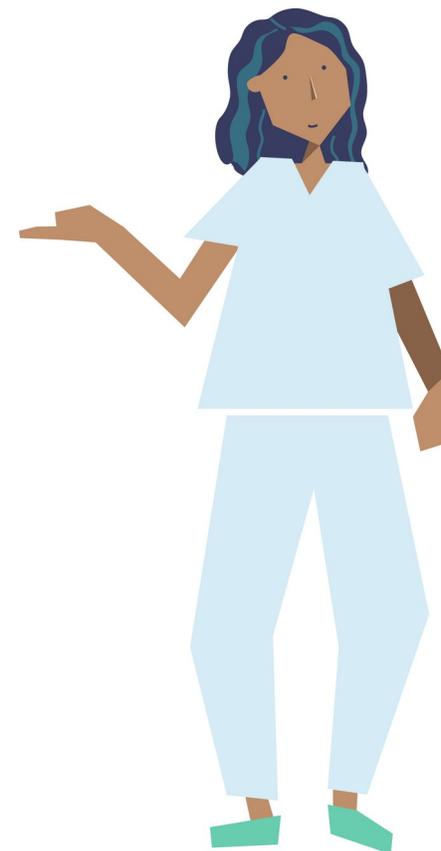
N [NERVOUS SYSTEM](#)

P [ANTIPARASITIC PRODUCTS, INSECTICIDES AND REPELLENTS](#)

R [RESPIRATORY SYSTEM](#)

S [SENSORY ORGANS](#)

V [VARIOUS](#)



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## A **ALIMENTARY TRACT AND METABOLISM**

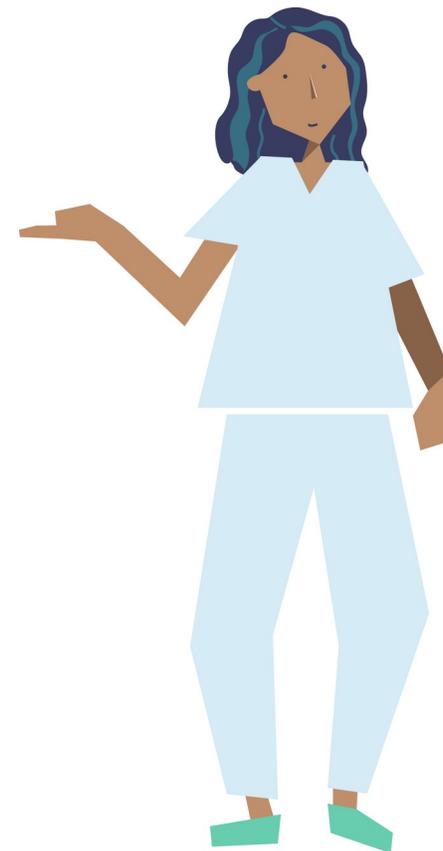
### A10 **DRUGS USED IN DIABETES**

#### A10A **INSULINS AND ANALOGUES**

#### A10B **BLOOD GLUCOSE LOWERING DRUGS, EXCL. INSULINS**

#### A10X **OTHER DRUGS USED IN DIABETES**

*Last updated: 2024-12-27*



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## A **ALIMENTARY TRACT AND METABOLISM**

### A10 **DRUGS USED IN DIABETES**

#### A10A **INSULINS AND ANALOGUES**

This group comprises both human - and animal insulins.

Insulin preparations are classified at 4 different 4th levels, according to onset and duration of action.

Each 4th level is differentiated in 5th levels according to origin of insulin.

Products consisting of, e.g. beef and pork insulin, are classified as combinations (30-levels) at each 4th level according to onset and duration of action.

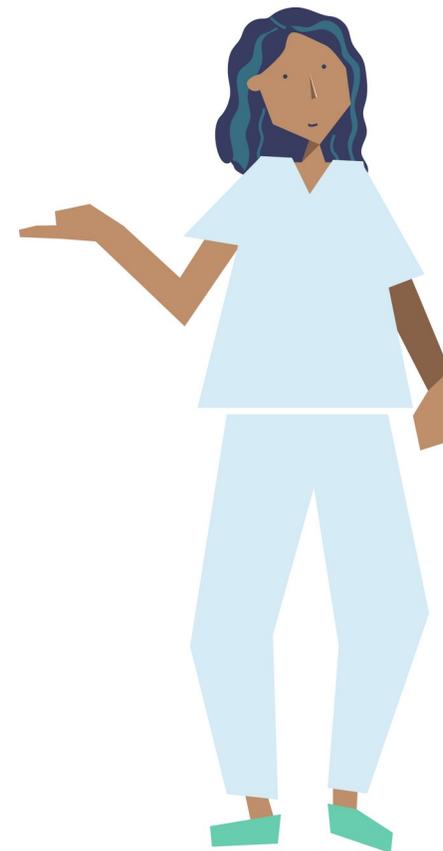
The DDD for insulins is 40 units.

#### A10B **BLOOD GLUCOSE LOWERING DRUGS, EXCL. INSULINS**

Fixed combinations of blood glucose lowering drugs and lipid modifying agentes are classified here.

#### A10X **OTHER DRUGS USED IN DIABETES**

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## A **ALIMENTARY TRACT AND METABOLISM**

### A10 **DRUGS USED IN DIABETES**

#### A10B **BLOOD GLUCOSE LOWERING DRUGS, EXCL. INSULINS**

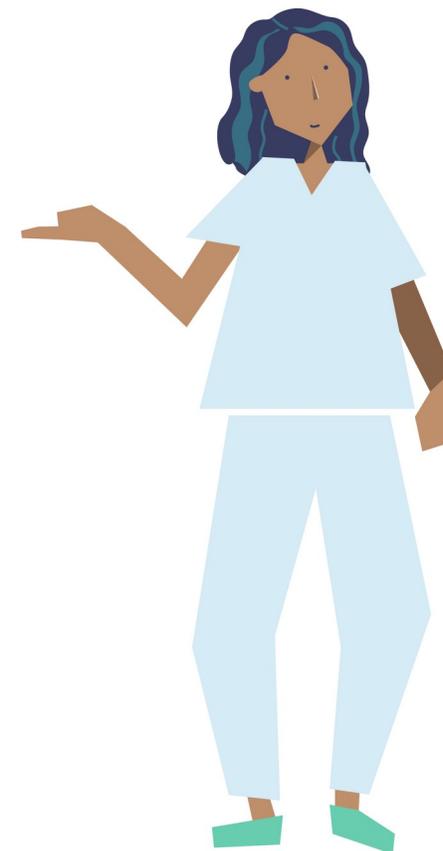
Fixed combinations of blood glucose lowering drugs and lipid modifying agents are classified here.

#### A10BA **Biguanides**

ATC code	Name	DDD	U	Adm.R	Note
A10BA01	<a href="#">phenformin</a>	0.1	g	O	
A10BA02	<a href="#">metformin</a>	2	g	O	
A10BA03	<a href="#">buformin</a>	0.2	g	O	

[List of abbreviations](#)

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## Guidelines for ATC classification and DDD assignment

The guidelines describe the ATC classification system and the DDD methodology. The publication consists of a general part with information about the system and procedures and data requirements for ATC/DDD assignment and alterations. The second part of the publication, the interpretative guidelines, describes the different ATC levels down to the 4th level. The comments included vary from one ATC group to another. No comments are given if the establishment of ATC codes and DDDs are considered to cause no special problems.

The interpretative guidelines should be consulted whenever the ATC/DDD system is used for drug utilization research. They describe particular issues, which have been discussed and resolved by consensus of the working group.

The guidelines are updated annually. The Guidelines can be ordered as a paper copy (English or Spanish versions) from the Centre (order form). A searchable version of the ATC/DDD Index linked to the text from the Guidelines is available on this website (ATC/DDD Index).

Suggested citation: WHO Collaborating Centre for Drug Statistics Methodology, Guidelines for ATC classification and DDD assignment, 2025. Oslo, 2025.

A pdf version of the Guidelines is available here:



[Guidelines 2025](#)

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Last updated: 2025-01-30

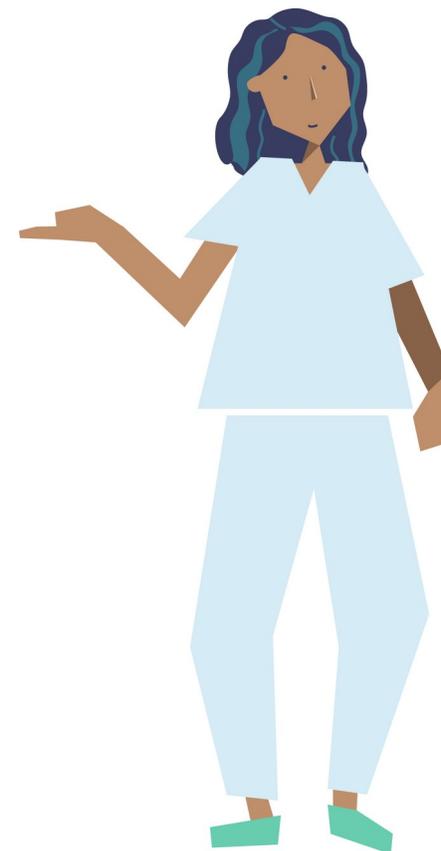
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# General principles for ATC classification

## ATC assignment

ATC codes to cover:

- Products with MA approval
- New substances for which an application for MA is ready for submission



ATC codes upon request from the users

Each medicinal product is assigned one and only one ATC code

Classification considering main indication, mechanism of action, route of administration, and maintenance doses

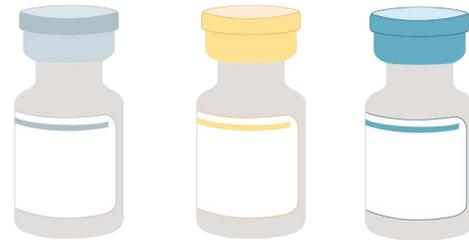
# General principles for ATC classification

## ATC assignment

More than 1 ATC code for a substance?

Clearly **different therapeutic uses** reflected in different:

- routes of administration
- strengths



# General principles for ATC classification

## ATC assignment

### More than 1 ATC code for a substance?

Clearly **different therapeutic uses** reflected in different:

- routes of administration
- strengths

<i>Substance X</i>		
<i>Indication</i>	Y	Z
<i>Dossage</i>	5-10 mg x 2	10-20 mg x 2

# General principles for ATC classification

## ATC assignment

More than 1 ATC code for a substance?

Clearly **different therapeutic uses** reflected in different:

- routes of administration
- strengths

<i>Substance K</i>		
<i>Indication</i>	<i>L</i>	<i>M</i>
<i>Dossage</i>	<i>5 mg x 2</i>	<i>20 mg x 2</i>

# General principles for ATC classification

## ATC assignment

### X groups («others»)

For substances not clearly belonging to any existing ATC 4th level

### New specific 4th levels?

- $\geq 2$  products with MA approval
- benefit for drug utilization research

# General principles for ATC classification

ATC assignment

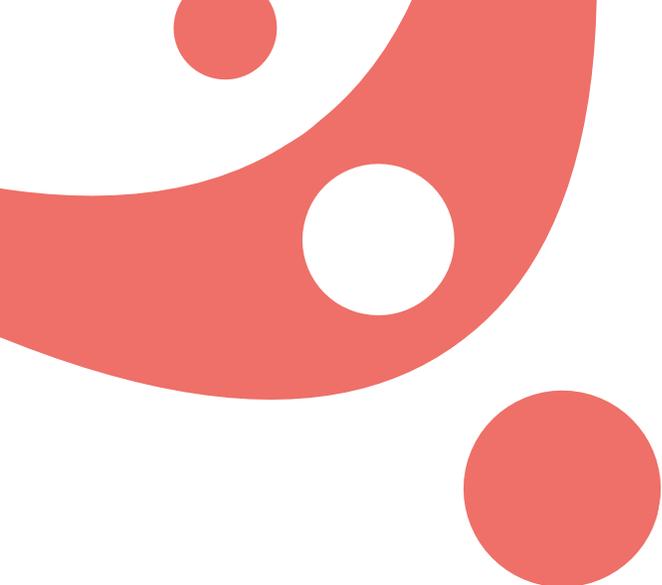
Combination products

Products containing  $\geq 2$  active ingredients

Also includes combination packages

- A medicinal preparation can be identified by one and only ATC code
- Specific annotations in the Guidelines





# Implementing the methodology

Assigning an ATC code to a product

Missing an ATC code or a DDD?

# Implementing the methodology

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## Updates included in the ATC/DDD Index

Updates to be included in the ATC/DDD Index 2025 (valid from 1 January 2025)

[New ATC 5th levels](#)  
[New ATC 3rd and 4th levels](#)  
[ATC level alterations](#)  
[ATC level name alterations](#)  
[New DDDs](#)  
[DDD alterations](#)

The complete list of the new ATC codes, DDDs and alterations to be included in the ATC/DDD Index 2025 is available in Excel format [here](#).

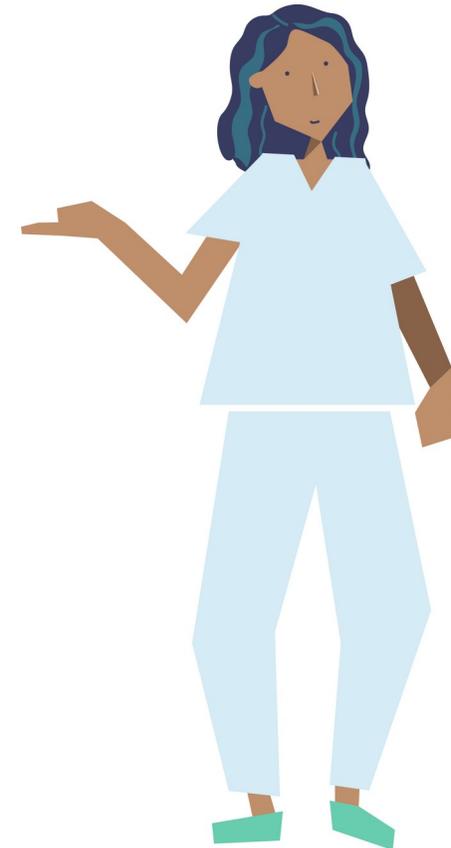
Temporary ATC/DDDs and alterations decided at the latest meeting(s) in the WHO international Working Group see [Lists of temporary ATC/DDD and alterations](#) (to be implemented in the Index 2026).

### Updates included in the ATC/DDD Index 2024

The complete list of the new ATC codes, DDDs and alterations included in the ATC/DDD Index 2024 is available in Excel format [here](#).

For Spanish versions, please contact the [WHO Centre](#).

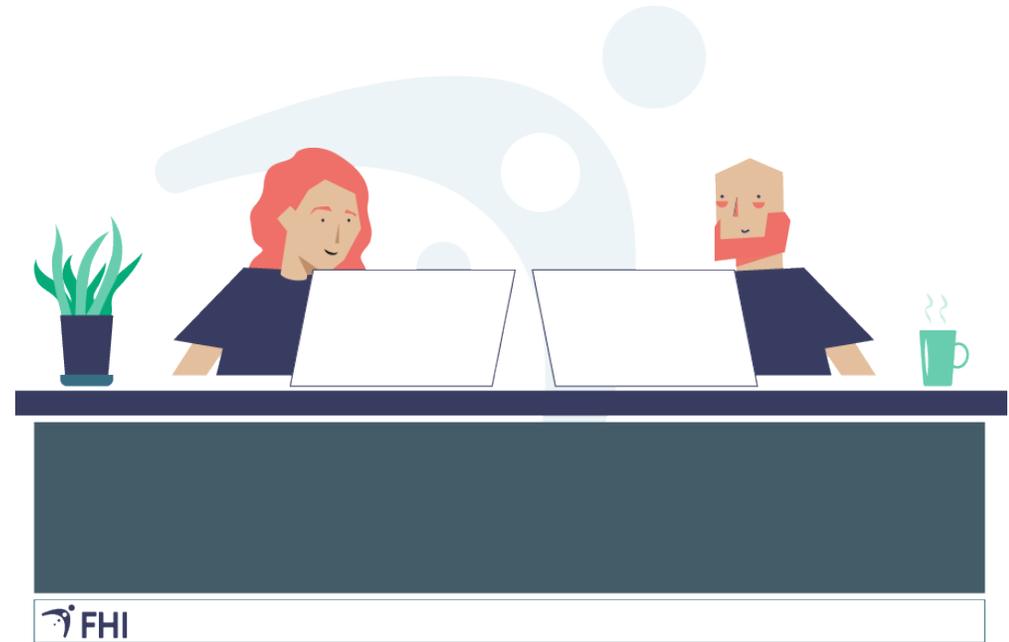
Last updated: 2024-12-03



# Missing an ATC code or a DDD?

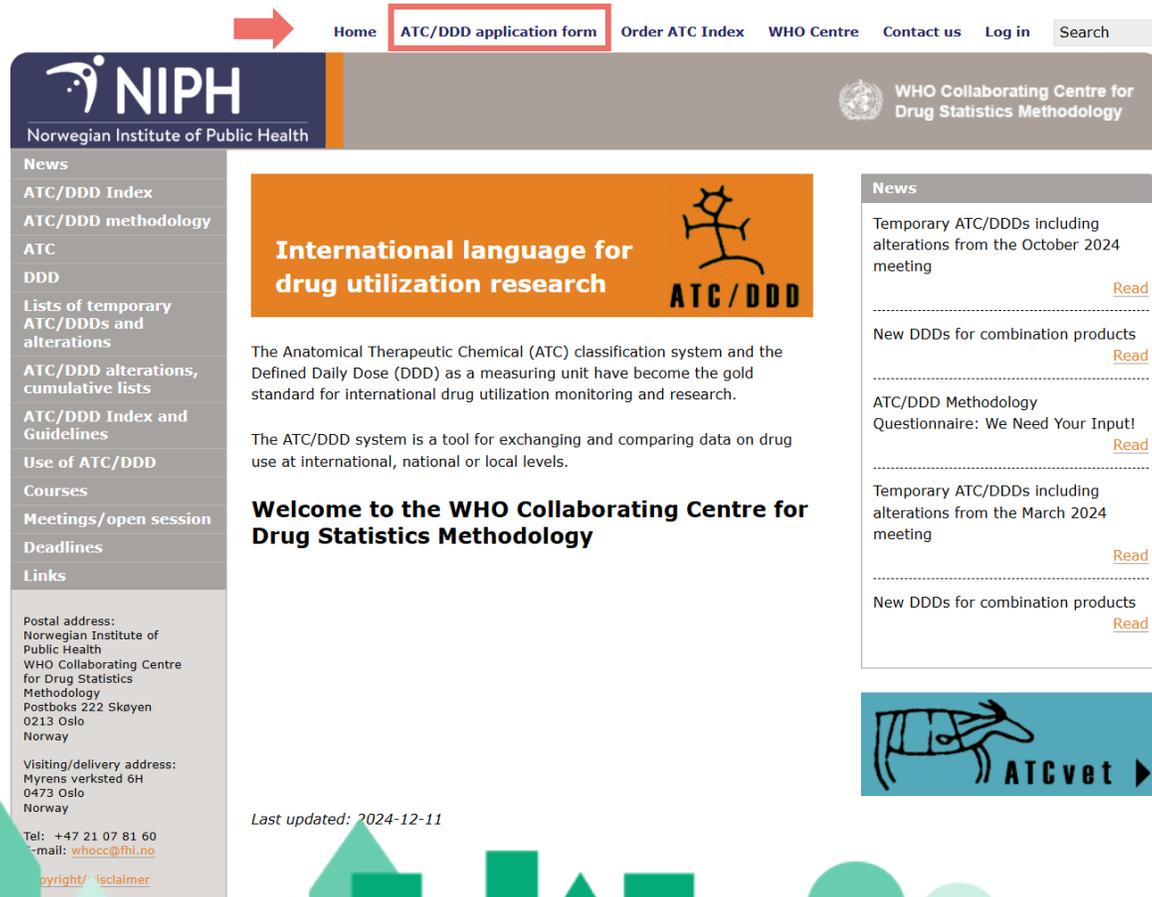
## Troubleshooting?

- Apply for an ATC code
- Contact the ATC/DDD Centre



# Missing an ATC code or a DDD?

## Troubleshooting?



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**International language for drug utilization research** **ATC/DDD**

The Anatomical Therapeutic Chemical (ATC) classification system and the Defined Daily Dose (DDD) as a measuring unit have become the gold standard for international drug utilization monitoring and research.

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- ATC/DDD Methodology Questionnaire: We Need Your Input! [Read](#)
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- New DDDs for combination products [Read](#)

**ATCvet**

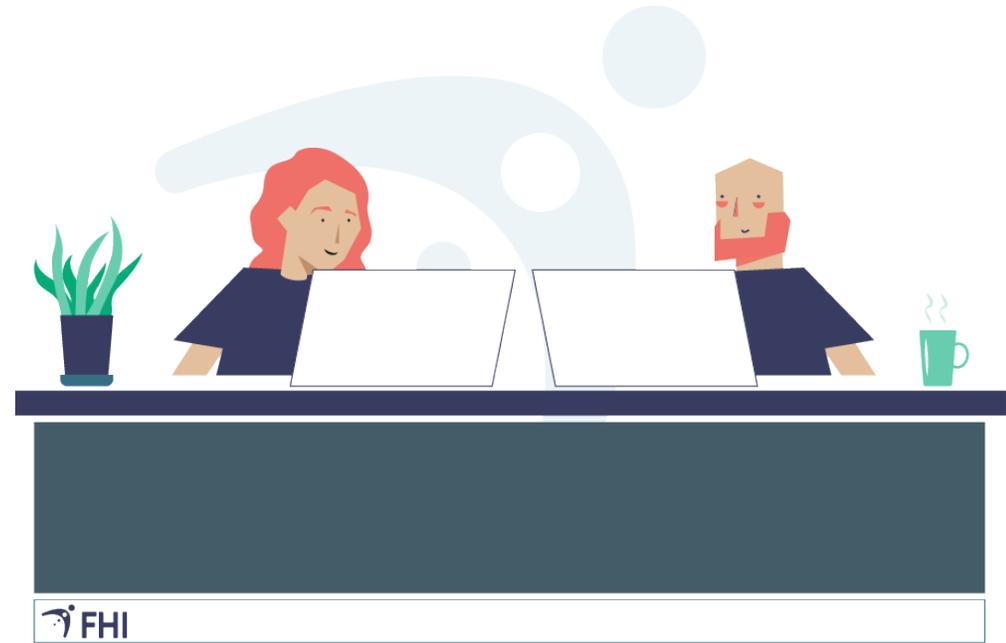
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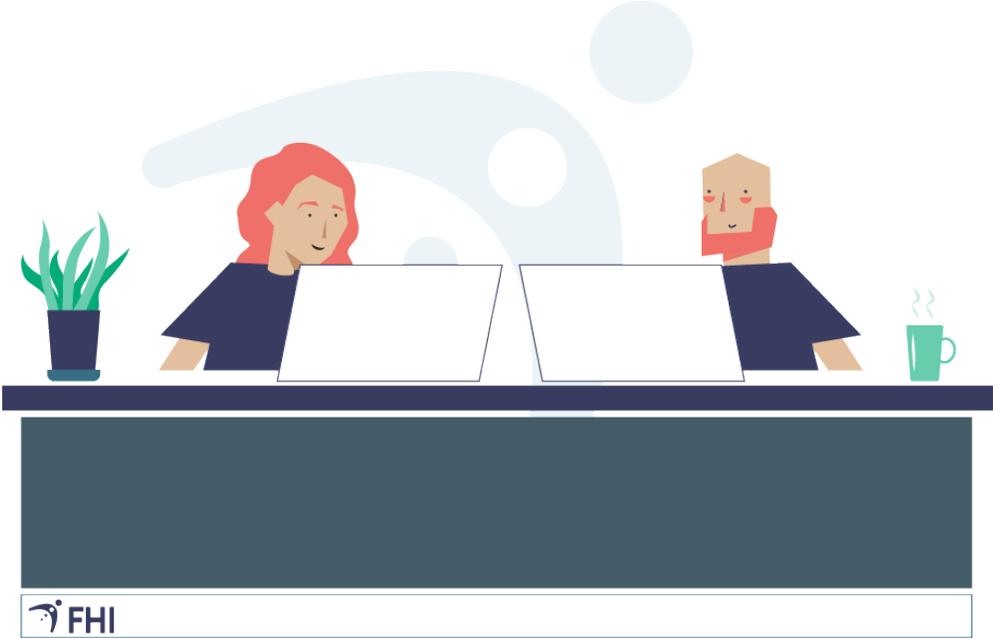
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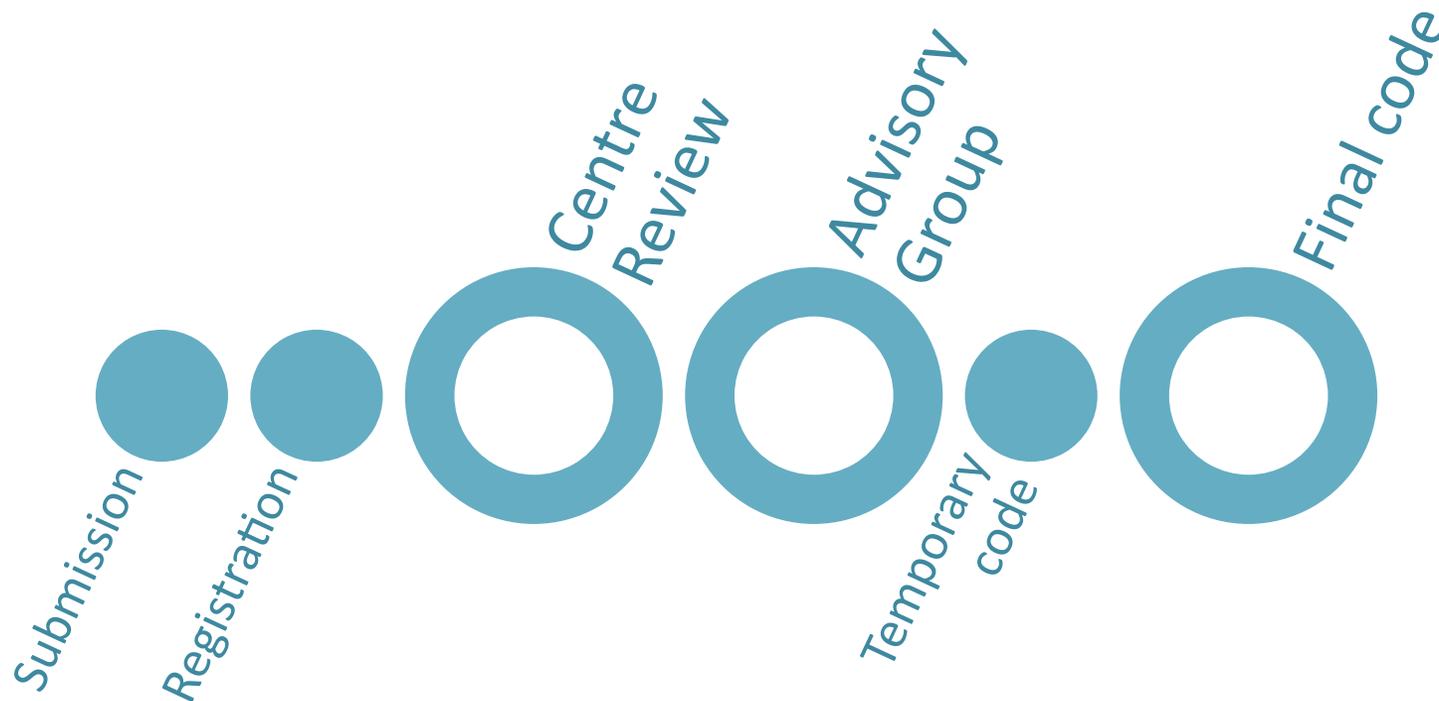
## Submit an application online

- Brand name
  - Active ingredients
  - Dosage form and Strengths
  - Marketing Authorisation (MA) status
  - Main indication and other indications
  - Approved dose recommendations (if possible)
  - Mechanism of action
- 
- Necessary documentation should be attached (for example, Medication Package Insert)
  - Applicant's proposal and other relevant documentation



# Missing an ATC code or a DDD?

Submit an application online



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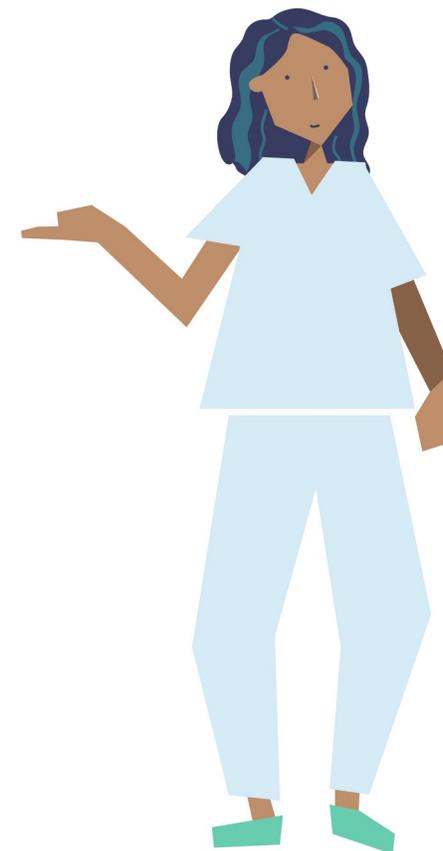
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## New ATC 5th levels

List of latest ATC/DDD decisions from the WHO International Working Group for Drug Statistics Methodology. Comments or objections to the decisions should be forwarded to the WHO Collaborating Centre for Drug Statistics Methodology within the deadline (see list). If no objections are received, the new ATC/DDD decisions will be considered final and included in the ATC/DDD Index. In the list [final](#) indicates that the date for objection has expired. The year of implementation in the ATC/DDD Index is given in the list.

Please note that the ATC and DDD [alterations](#) are only valid and implemented in the coming annual updates of January 1st.

ATC code	ATC level name	Deadline for objection to temporary codes	Implementation in ATC/DDD index
A05AA06	norucholic acid	01.02.2025	2026
A05AX08	linerixibat	01.02.2025	2026
A05BA11	resmetirom	01.02.2025	2026
A10AE57	insulin icodec and semaglutide	01.02.2025	2026
A10BD31	metformin, sitagliptin and dapagliflozin	01.02.2025	2026
A10BD32	glimepiride and dapagliflozin	01.02.2025	2026
A10BD33	pioglitazone and dapagliflozin	01.02.2025	2026
A12CB04	zinc orotate	01.02.2025	2026
A16AB28	verenafusp alfa	01.02.2025	2026
A16AX26	glepaglutide	01.02.2025	2026
A16AX27	apraglutide	01.02.2025	2026
A16AX28	sepiapterin	01.02.2025	2026
A16AX29	doxocitine and doxribtimine	01.02.2025	2026
B02BD18	arvenacogene sanparvovec	01.02.2025	2026
B02BX12	fitusiran	01.02.2025	2026
B06AC09	donidalorsen	01.02.2025	2026



# Implementing the methodology

atcddd.fhi.no



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Norwegian Institute of Public Health



WHO Collaborating Centre for Drug Statistics Methodology

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Postal address:  
Norwegian Institute of Public Health  
WHO Collaborating Centre for Drug Statistics Methodology  
Postboks 222 Skøyen  
0213 Oslo  
Norway

Visiting/delivery address:  
Myrens verksted 6H  
0473 Oslo  
Norway

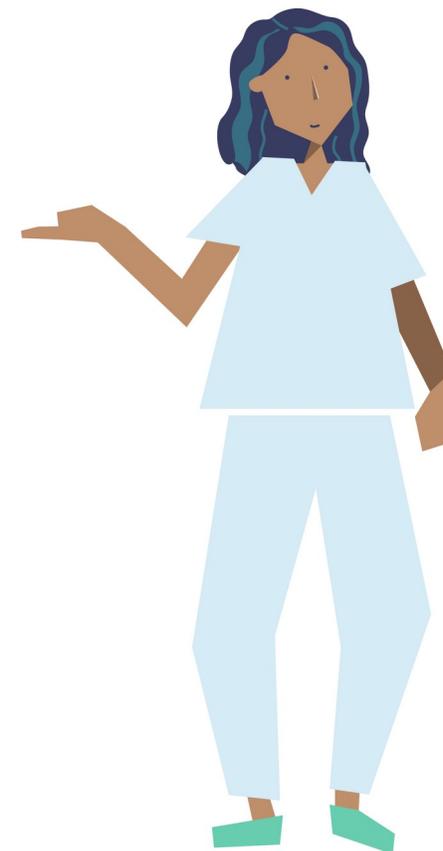
Tel: +47 21 07 81 60  
E-mail: [whocc@fhi.no](mailto:whocc@fhi.no)

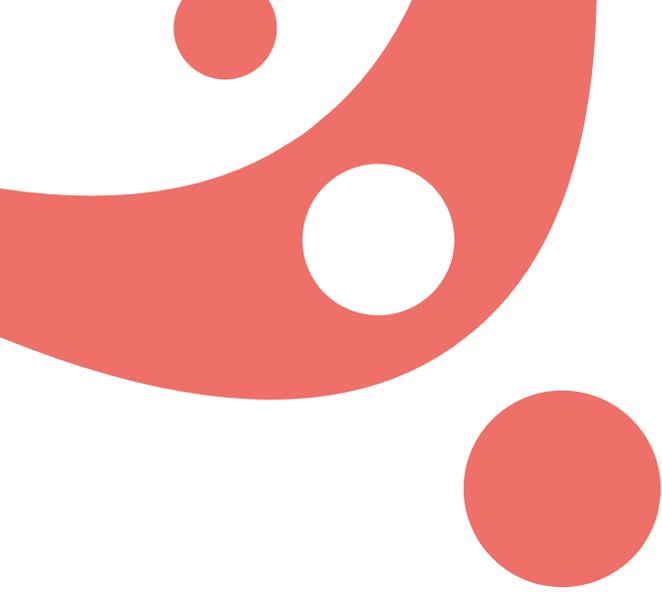
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## ATC alterations from 2005-2024

Cumulative overview of all ATC alterations performed in the period 2005-2024. The year changed is when the alterations were implemented in the ATC/DDD Index.

<u>Previous ATC code</u>	<u>Substance name</u>	<u>New ATC code</u>	<u>Year changed</u>
A01AD02 <sup>27)</sup>	benzydamine	R02AX03	2018
A03AE02	tegaserod	A06AX06	2013
A03AE04	prucalopride	A06AX05	2013
A10BX04	exenatide	A10BJ01	2017
A10BX07	liraglutide	A10BJ02	2017
A10BX09	dapagliflozin	A10BK01	2017
A10BX10	lixisenatide	A10BJ03	2017
A10BX11	canagliflozin	A10BK02	2017
A10BX12	empagliflozin	A10BK03	2017
A10BX13	albiglutide	A10BJ04	2017
A10BX14	dulaglutide	A10BJ05	2017
A11CC07	paricalcitol	H05BX02	2010





# Using the methodology

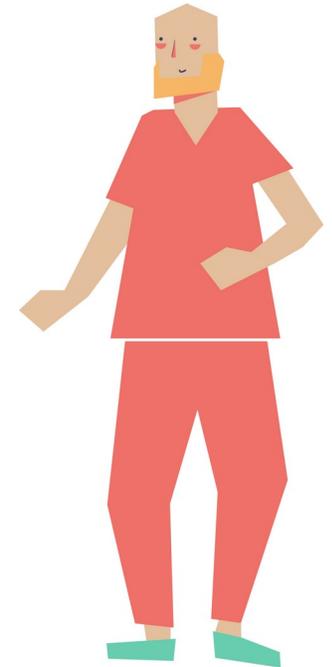
Drug statistics and pharmacoepidemiology

Clinical practice and decision making

# Drug statistics and pharmacoepidemiology

## Using the ATC/DDD

- Drug consumption
- Trends in drug utilisation
- Drug reactions, drug monitoring
- Polypharmacy, medication appropriateness
- Drug interactions
- Adherence
- Clinical outcomes
- Drug repurposing
- Comparative analyses between regions or populations
- Mapping



# Clinical practice and decision making

## Using the ATC/DDD

- Medical health records
- Prescriptions
- Clinical guidelines, protocols, procedures
- Clinical decision support tools
- Pharmacovigilance, risk assessment for adverse events



Thank you

