



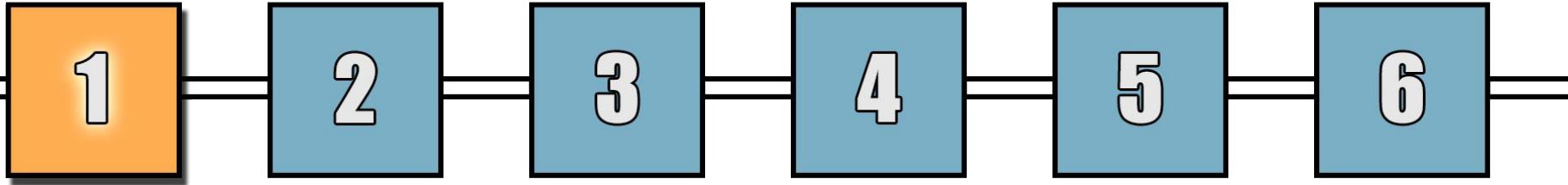
**UiT** The Arctic University of Norway

# *Over-the-Counter Escapades:* Teenagers' influence on medication habits

Rafael Nozal Cañas

HDL Seminar 2023.09.18





# Over the counter **PREVALENCE**



**16.2% - Misuse:** legitimai reasons, but improperly

**2.0% - Abuse:** illegitimai reasons

**7.2% - Dependence:** abuse and unable to quit

<https://www.doi.org/10.1186/S40545-021-00350-7>

<https://doi.org/10.56367/OAG-039-10036>

<https://doi.org/10.3390%2Fijerph18115530>

<https://www.doi.org/10.17219/ACEM/58887>



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## General OTC

- If I take more I will get cured faster
- Suicide

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### Analgesics (50%)

- Recreational
- Improve sleep
- Threat infections
- Cure hangovers (25%)



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### Cough serums

- Recreational
- To get pregnant

### Antihistamines

- Recreational
- General relaxation
- Sport dopping

### Laxatives

- Weight loss

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<https://doi.org/10.4236/ojn.2018.811065>



55% Sold in non-pharmaceutical outlets



55% Sold in non-pharmaceutical outlets



Increased number of self-poisoning in  
15 to 19 years old women



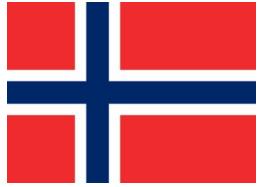
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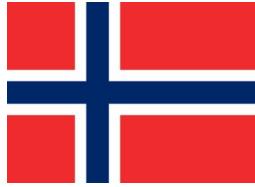






# Why?:

*“...physical pain, conflicts with family and peers, a strong need to feel appreciated and appear successful, stress and fatigue.”*

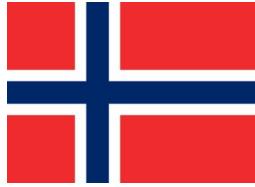


## Why?:

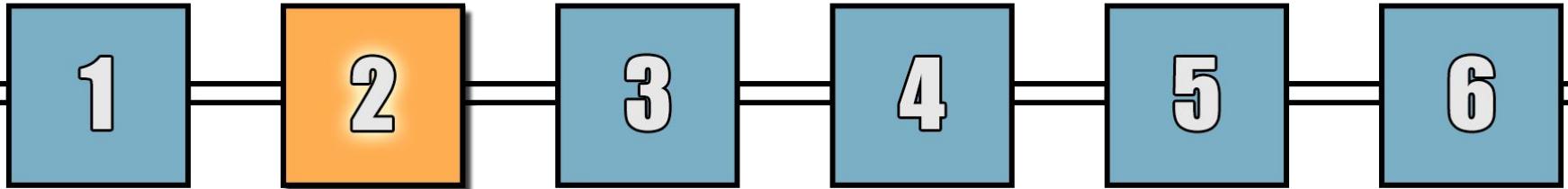
*“...physical pain, conflicts with family and peers, a strong need to feel appreciated and appear successful, stress and fatigue.”*

## Who?:

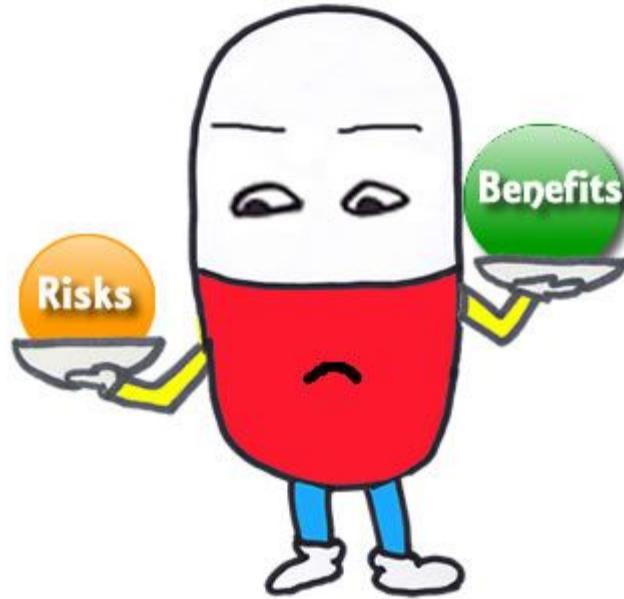
*“...widespread and frequent pain, binge drinking, lower self-esteem, higher frequency of school abstinence, engaged in more spare-time work, higher consumption of caffeinated drinks, less sleep and lower educational ambitions”*



**Parents' symptom** experience seems to influence their children's medicine use over and above medicine use indicated by symptoms. Two potential explanations are suggested: **a socialization pathway** and/or a pathway through **adverse living conditions**."



# Self medication **DANGERS**

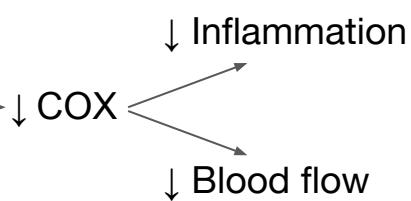


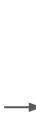
## (I) Adverse effects



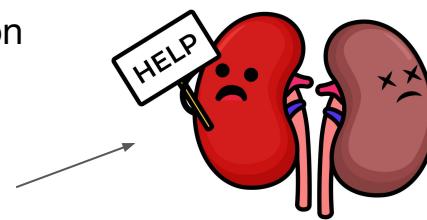


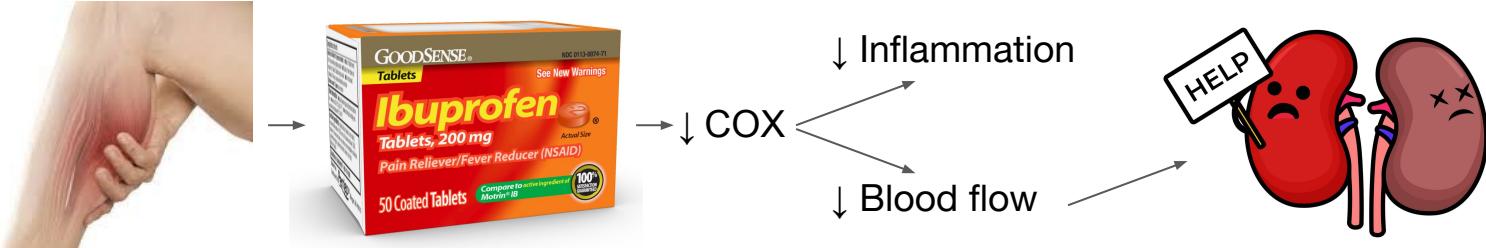


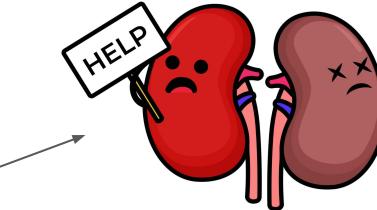
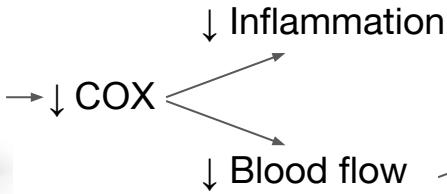




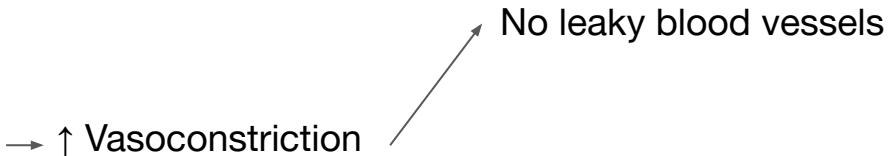
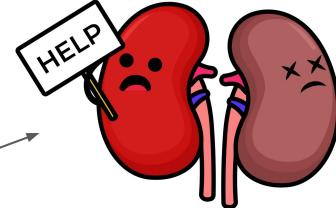
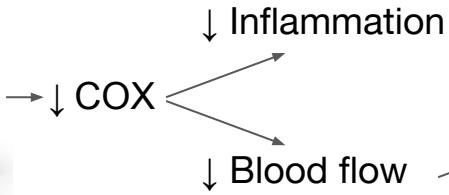
↓ Inflammation  
↓ COX  
↓ Blood flow

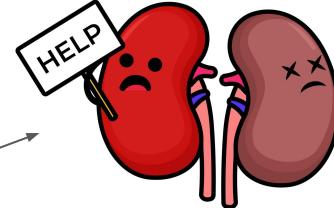
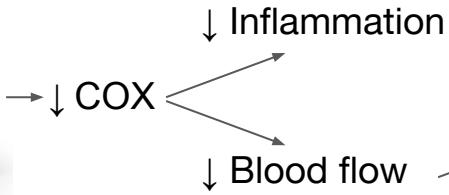




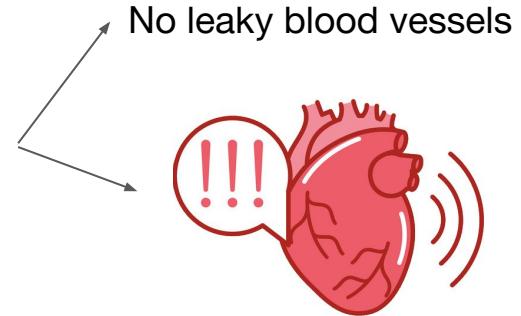


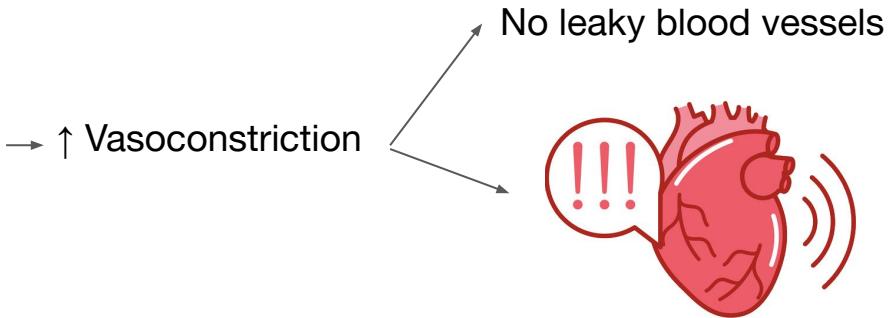
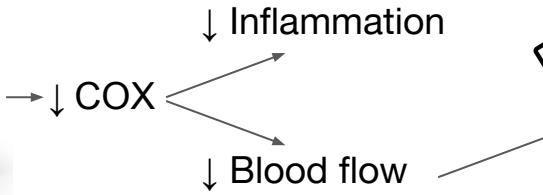
→ ↑ Vasoconstriction

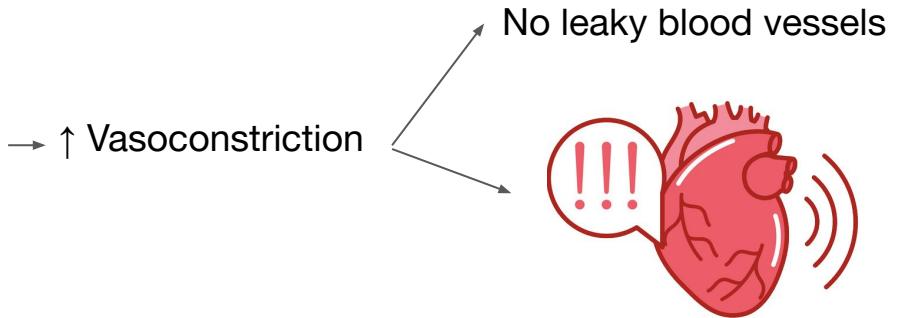
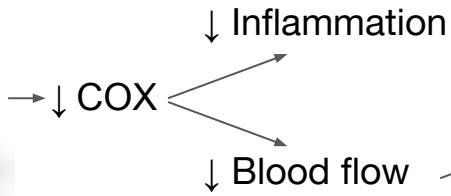




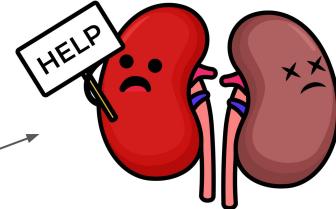
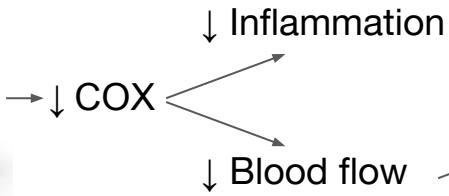
→ ↑ Vasoconstriction



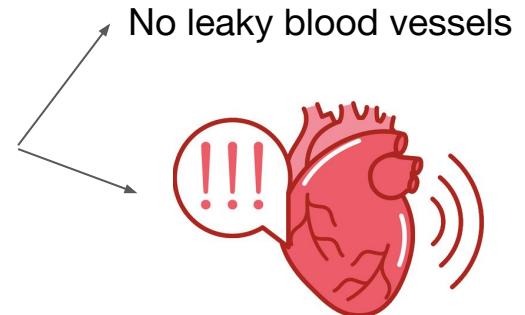




Acetaminophen

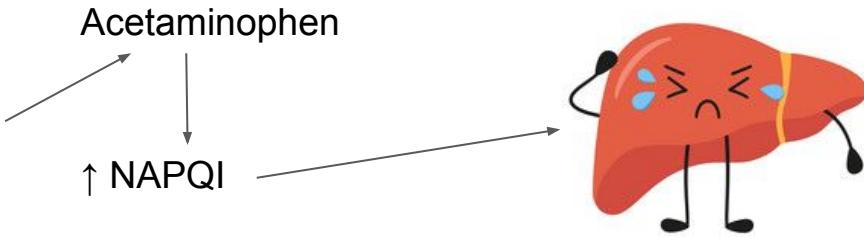
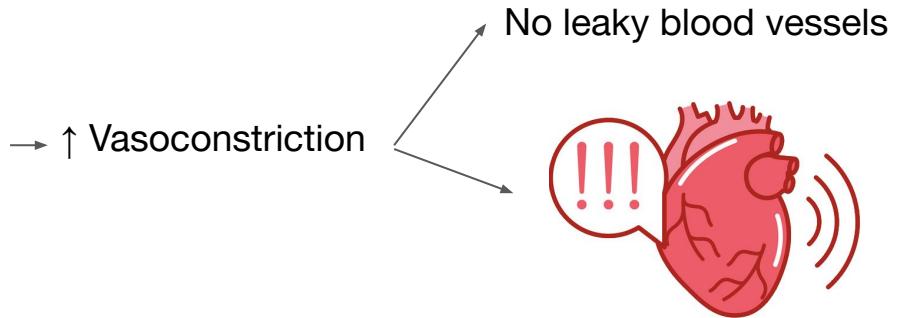
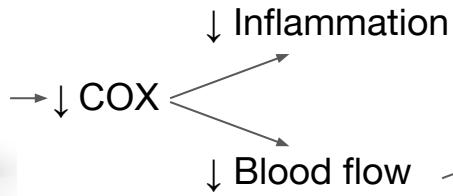


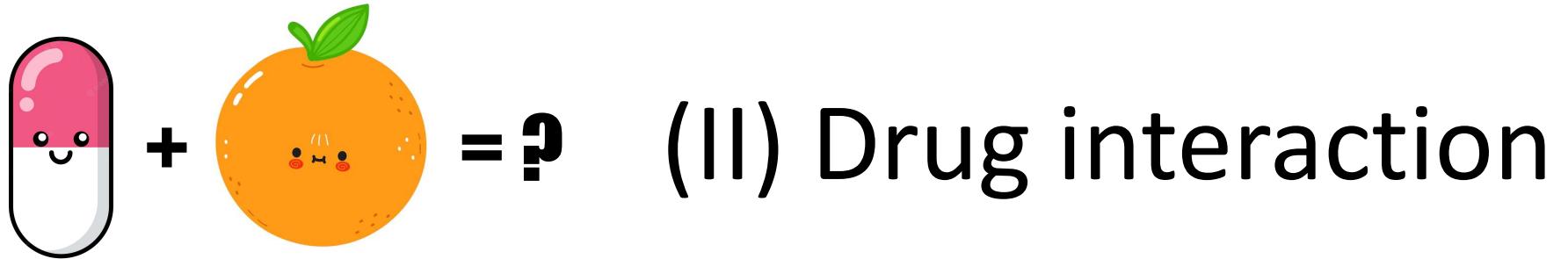
↑ Vasoconstriction



Acetaminophen

↑ NAPQI





(II) Drug interaction

Saint John's worth  
( Prikkperikum )



# Possible Health Benefits of St. John's Wort



Mood boost and depression relief



Premenstrual syndrome (PMS)



Seasonal affective disorder



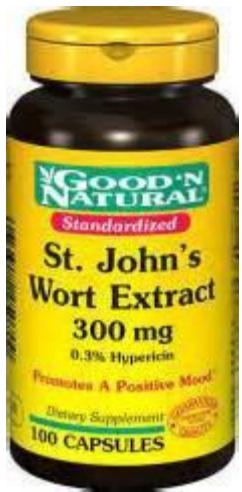
Anxiety relief



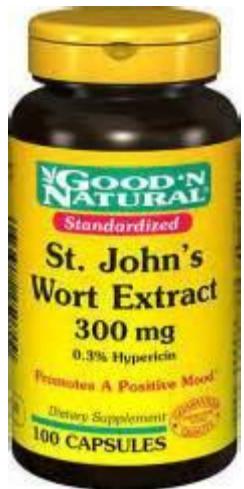
Menopause-related symptoms



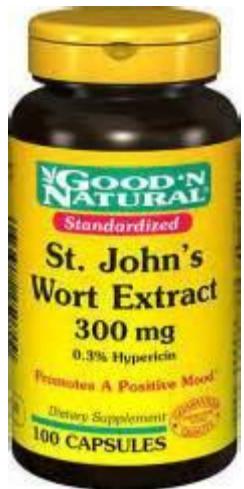
Smoking cessation

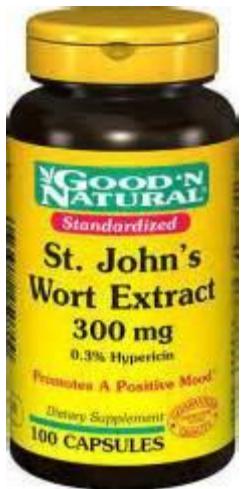


## Anticuagulant



Anticuagulant

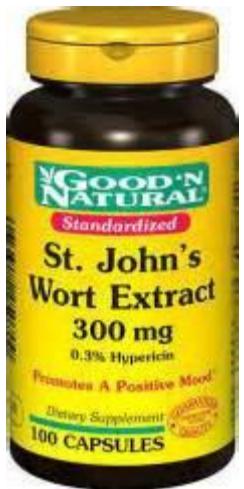




Anticuagulant



Anti HIV

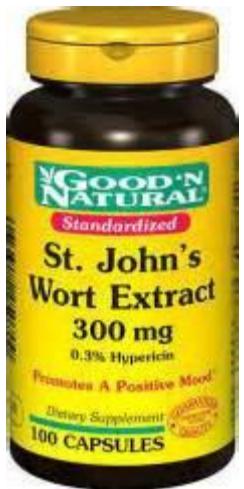


Anticuagulant



Anti HIV





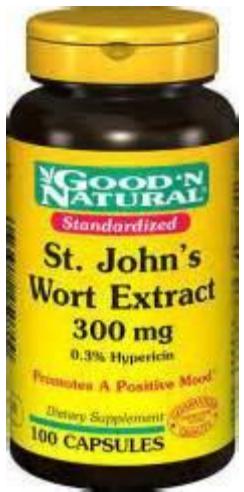
Anticoagulant



Anti HIV



Digoxin



Anticoagulant

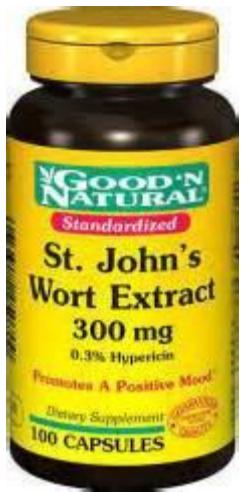


Anti HIV



Digoxin





Anticoagulant



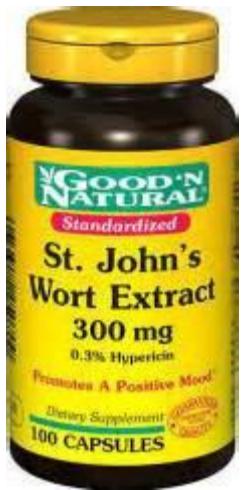
Digoxin



Anti HIV



Contraceptives



Anticoagulant



Digoxin

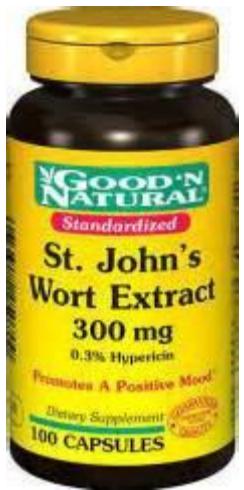


Anti HIV



Contraceptives





Anticuagulant



Anti HIV



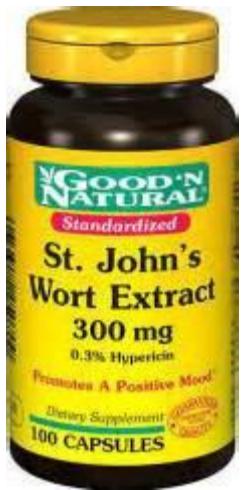
Digoxin



Contraceptives



Xanax



Anticuagulant



Anti HIV



Digoxin

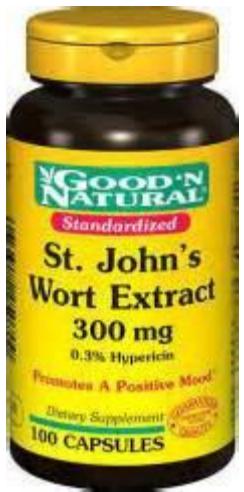


Contraceptives



Xanax





Anticoagulant



Anti HIV



Digoxin



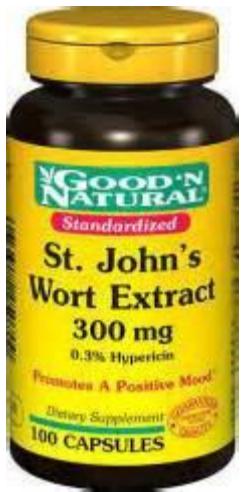
Contraceptives



Xanax



Antidepressant



Anticuagulant



Anti HIV



Digoxin



Contraceptives



Xanax



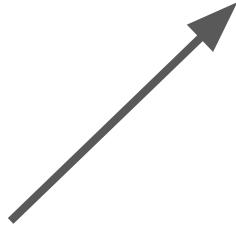
Antidepressant

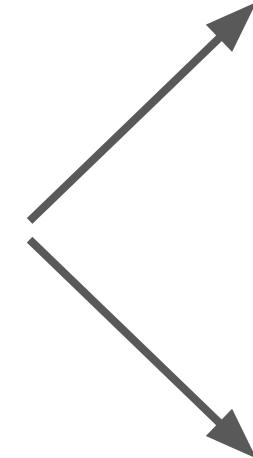


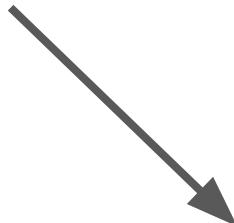


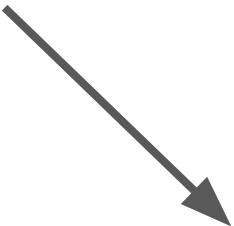
(III) Delay proper treatment













# (IV) Overdosage



ABC NEWS

VIDEO

LIVE

SHOWS

ELECTION 2024



# Girl Dies After Using Excess Of Muscle Cream

Medical examiner: New Yorker killed by high levels of anti-inflammatory drug.

By ABC News **GMA**

February 10, 2009, 9:44 PM





ABC NEWS

VIDEO

LIVE

SHOWS

ELECTION 2024



# Girl Dies After Using Excess Of Muscle Cream

Medical examiner: New Yorker killed by high levels of anti-inflammatory drug.

By ABC News **GMA**

February 10, 2009, 9:44 PM



Journal Article •

Save

**Over-the-counter topical musculoskeletal pain relievers used with a heat source: a dangerous combination.**

Shayna C Rivard, Megan A Brelsford<sup>1</sup>, Neil F Gibbs<sup>2</sup> • Institutions (2) ▾

01 Nov 2017 • Cutis (Cutis) • Vol. 100, Iss: 5

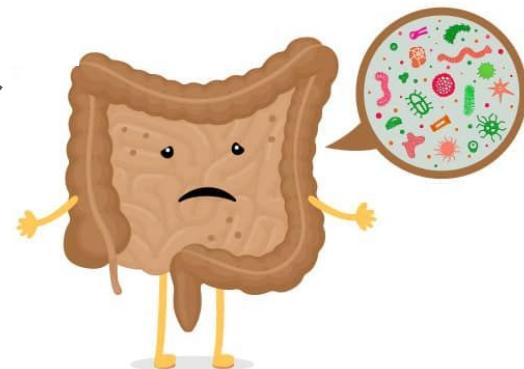


(v) Hiding diseases



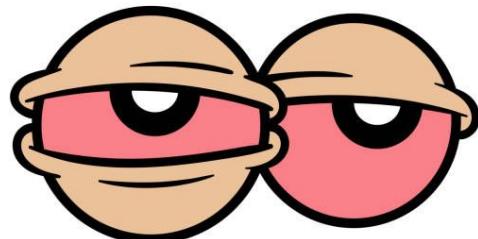
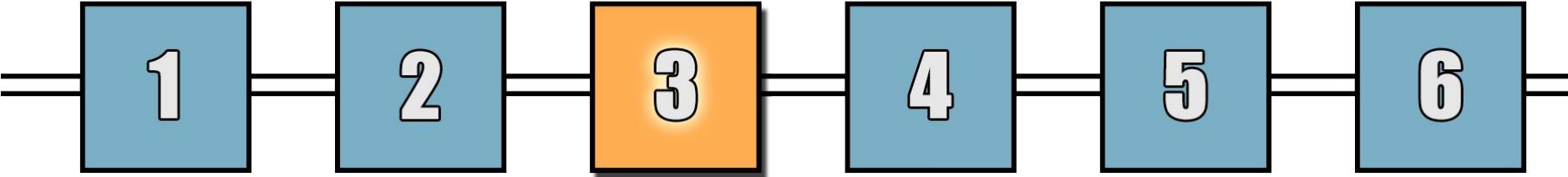








## (VI) Addiction



# How to get high **LEGALLY!**

\* The Health Data Lab is an irresponsible group and doesn't take responsibility of anything said here

# WHAT?

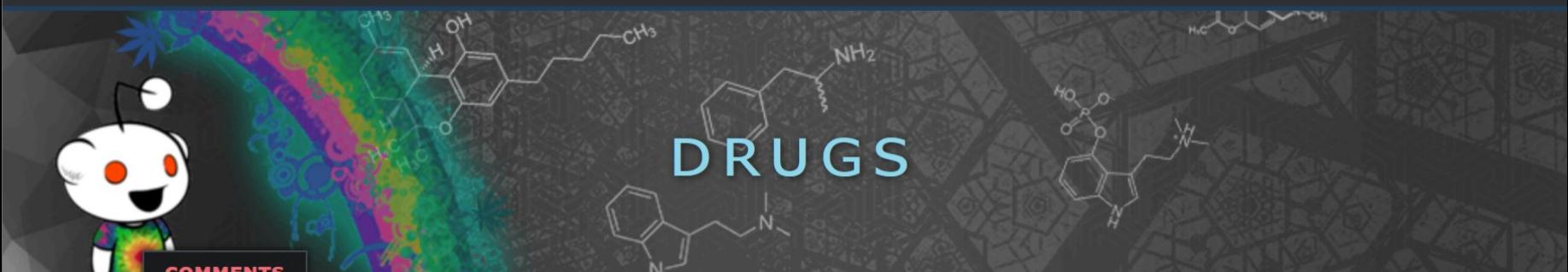
**"Pharming":** the abuse of prescription and over-the-counter drugs by cool teens

# WHY?

Prescription drugs and OTC are perceived as more socially acceptable, less stigmatising, and safer

# HOW?

Easy to acquire in pharmacies, online pharmacies, and easy to mix with alcohol and other illegal substances



COMMENTS

336  
↑  
↓

## How to Trip Safely On Benadryl (self.Drugs)

submitted 10 years ago \* by YesteryearsSnowdens

I see that this question comes up somewhat frequently on this subreddit so I figured I may as well just make a quick, easy go-to guide for this rather interesting trip.

First of all, before you decide to embark on this trip or not, you should know a little bit about what you're getting yourself into. The drug is a deliriant. What this means is that you will enter a realm where you will see things that are not real and have absolutely no mechanism for determining what's real and what isn't. There is no introspection here. There are no cool textural marks. Not even a detachment from your body. This is less something to do for fun and more as a "drug of interest."

**Things To Watch For and Early Dosages** Do NOT bother messing with this drug if you have any of the following:

- Glaucoma, any cardiac/heart problems, memory problems or allergies to the drug
- Are easily scared or around people who will be concerned about

search



this post was submitted on 04 Jun 2013  
**336 points** (85% upvoted)

shortlink: <https://redd.it/1fmizz>[Submit a new link](#)[Submit a new text post](#)

## Drugs

[join](#) 1,019,837 friendly faces round these parts  
1,980 beaming smiles in the audience

**Type****Mechanism of action****Effect****Addictive / Tolerance**

( 'poor man's methadone' )

Loperamide binds to peripheral  $\mu$ -opioid receptors in the gastrointestinal tract.

(50–800mg) Opioid, alleviate symptoms of opioid withdrawal, feelings of euphoria, psychoactive.

YES

## Type

## Mechanism of action

## Effect

## Addictive / Tolerance



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Unknown; central cannabinoidergic has been hypothesised.

(500–3,000mg) stimulant effects, including euphoria, hyperreactivity, psychotic symptoms, paranoia and visual hallucinations.

NO

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## Mechanism of action

## Effect

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Direct antagonist at muscarinic (M<sub>1</sub>) and dopamine (D<sub>2</sub>) receptors. First generation easily penetrates the blood-brain barrier.

(200–700mg) Calming and sedating effects. Can enhance other substances (ie: make opioids more hallucinogenic).

NO

## Type

## Mechanism of action

## Effect

## Addictive / Tolerance



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NO



Direct antagonist at muscarinic (M1) and dopamine (D2) receptors. First generation easily penetrates the blood-brain barrier.

(200–700mg) Calming and sedating effects. Can enhance other substances (ie: make opioids more hallucinogenic).

NO



Acetaminophen and similars. Prostaglandin synthetase inhibitor; not very well known effect on the CNS

Enhance opioids and alcohol. General feeling of relaxation

NO

**Type****Mechanism of action****Effect****Addictive / Tolerance**

Dextrophan (DXM), inhibit the excitatory amino acid and neurotransmitter Glutamate. NMDA receptor antagonist (ketamine)

(100–200mg), mild to moderate euphoria.  
(>1,000mg), hallucinations, paranoia, perceptual distortions, delusional beliefs, ataxia and out-of-body experiences

YES

## Type                      Mechanism of action                      Effect                      Addictive / Tolerance

	Dextrophan (DXM), inhibit the excitatory amino acid and neurotransmitter Glutamate. NMDA receptor antagonist (ketamine)	(100–200mg), mild to moderate euphoria. (>1,000mg), hallucinations, paranoia, perceptual distortions, delusional beliefs, ataxia and out-of-body experiences	YES
	Anticholinergic properties exerting potent CNS effects.	(200-1200 mg) Psychoactive effects, including: restlessness, excitement, euphoria, disorientation and characteristic deliriumlike states with auditory/ visual/and tactile hallucinations, altered mood and cognitive dysfunctions.  Use in robberies, express kidnappings and sexual assaults	NO

- Antispasmodic
- Motion sickness
- Antivomiting
- Antiabdominal cramps
- ...

## Type

## Mechanism of action

## Effect

## Addictive / Tolerance



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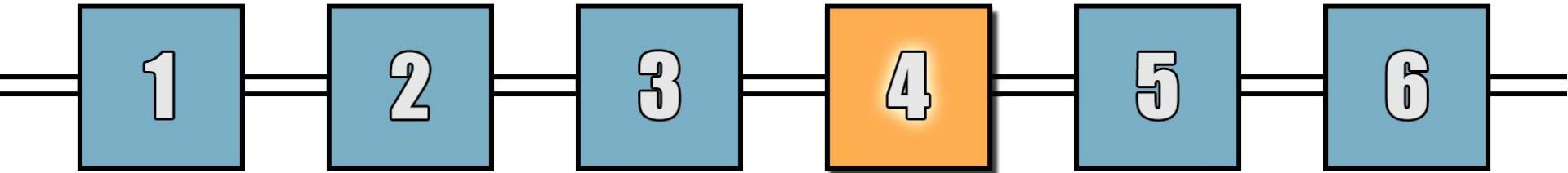


Z-drugs bind to the α-1 isoform of the benzodiazepine receptor, enhancing GABA inhibitory actions.

CNS depressant: relaxant, sedative and hypnotic effects.

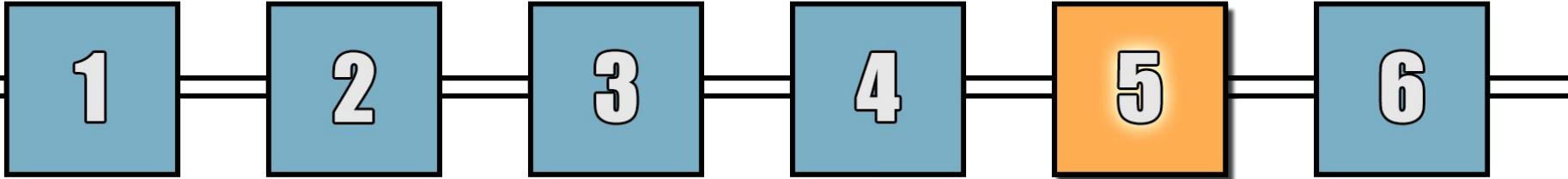
YES (long term)

( Non OTC, but easy to acquire )

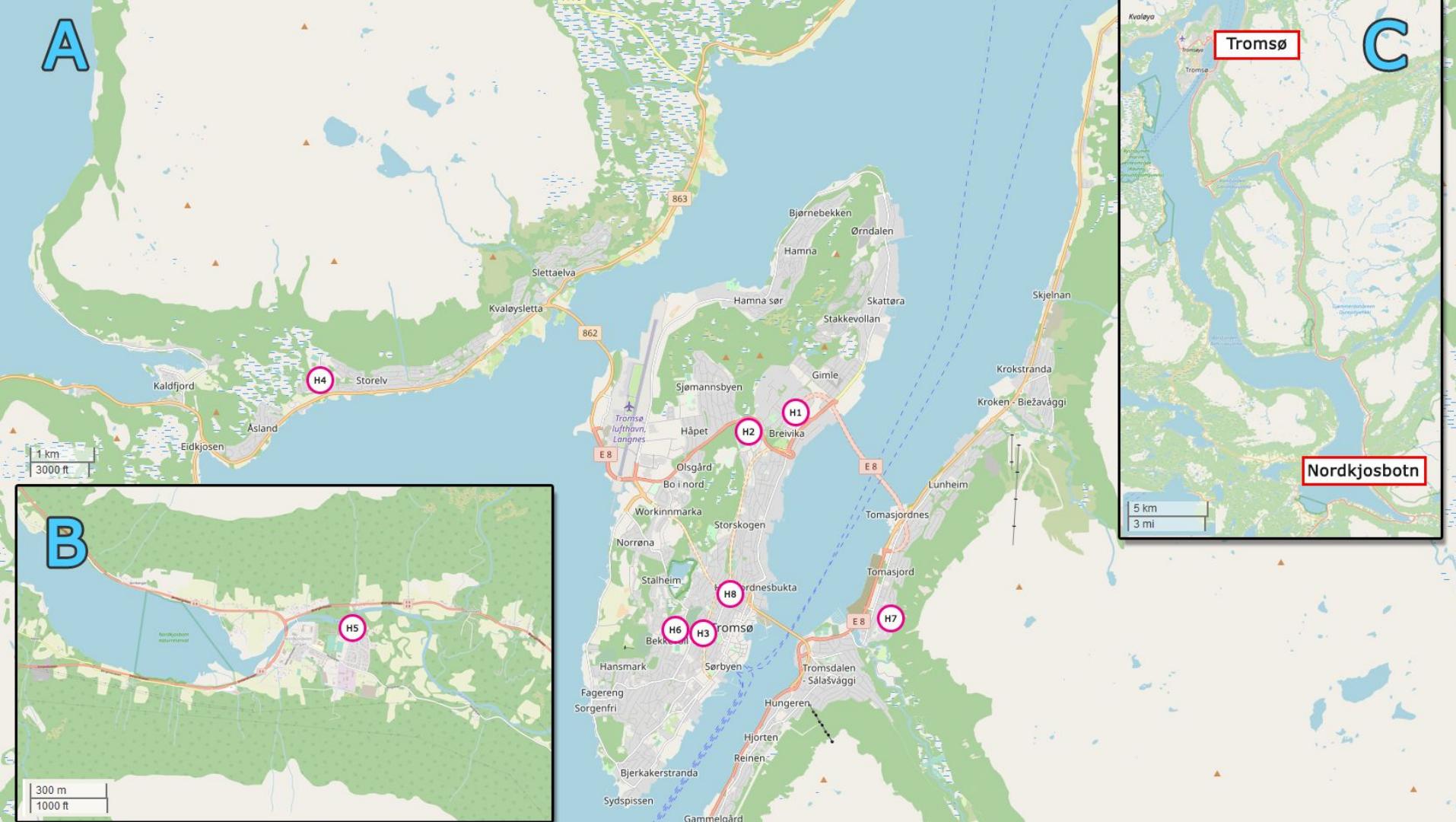


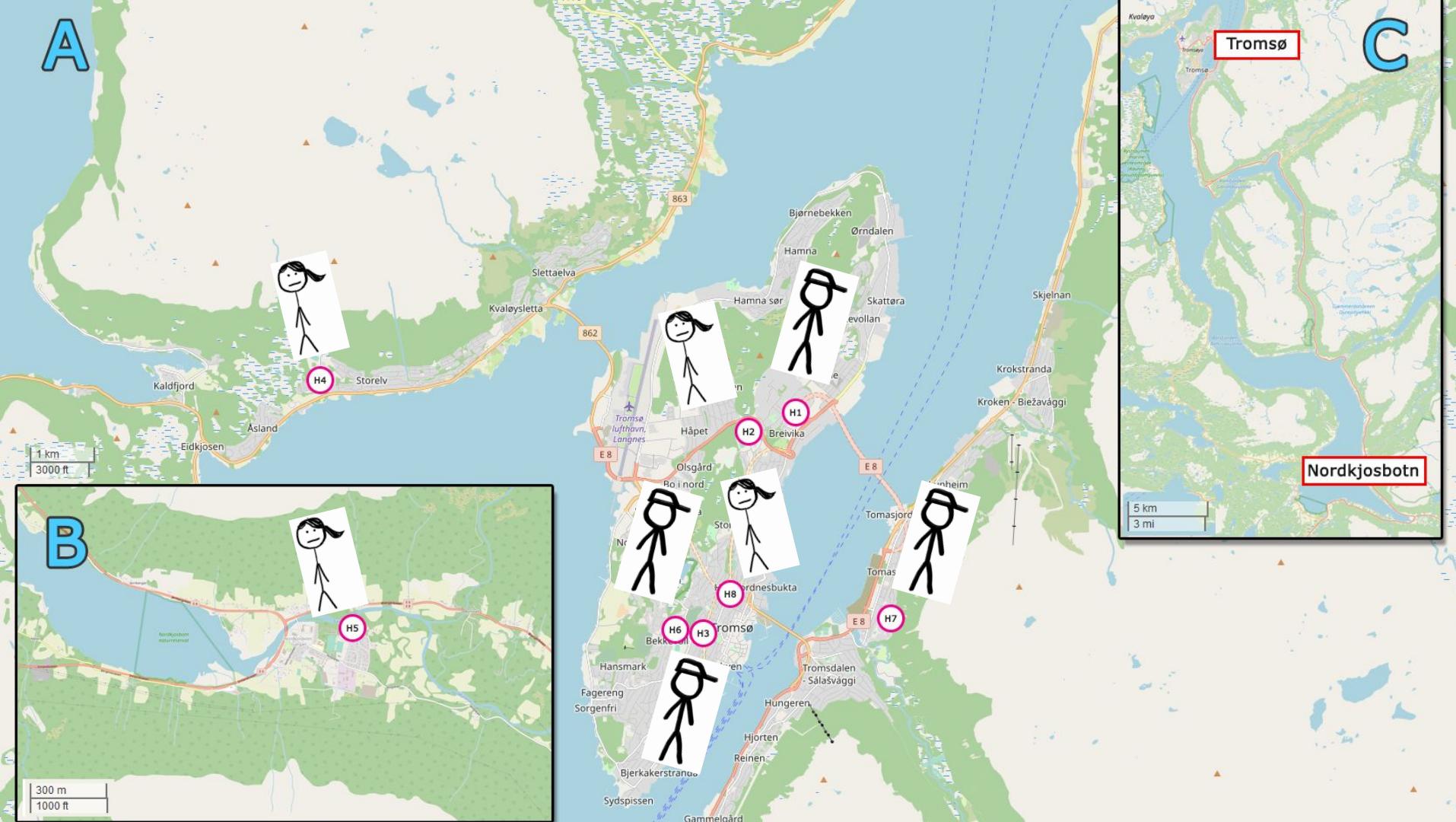
# OBJECTIVES

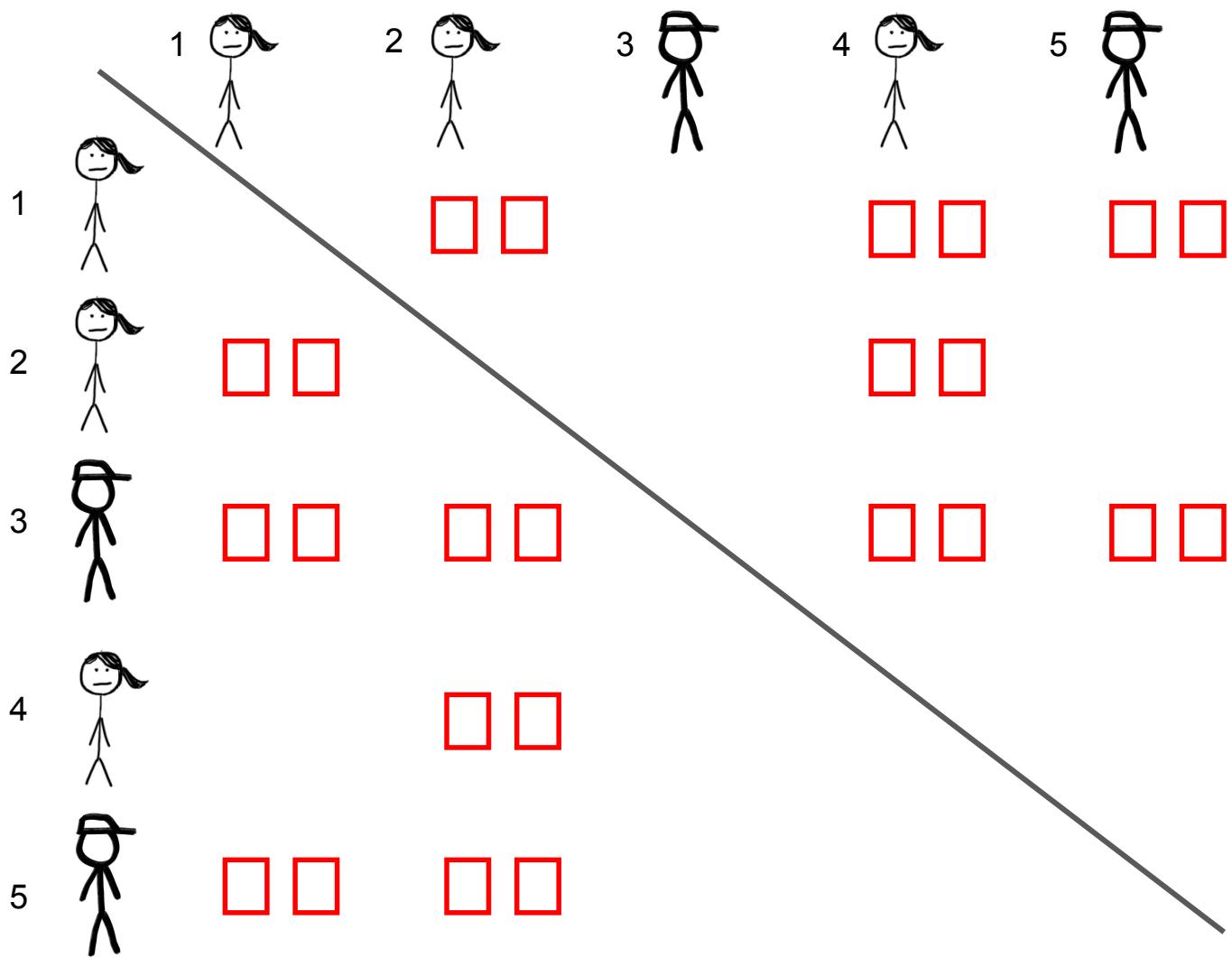
- Report Tromso usage so they can be compare with the rest of norway
- Check on self-medication misuse / abuse.
- See if the social network affect your medicine consumption



# METHODOLOGY







Are you together...



Physically



School



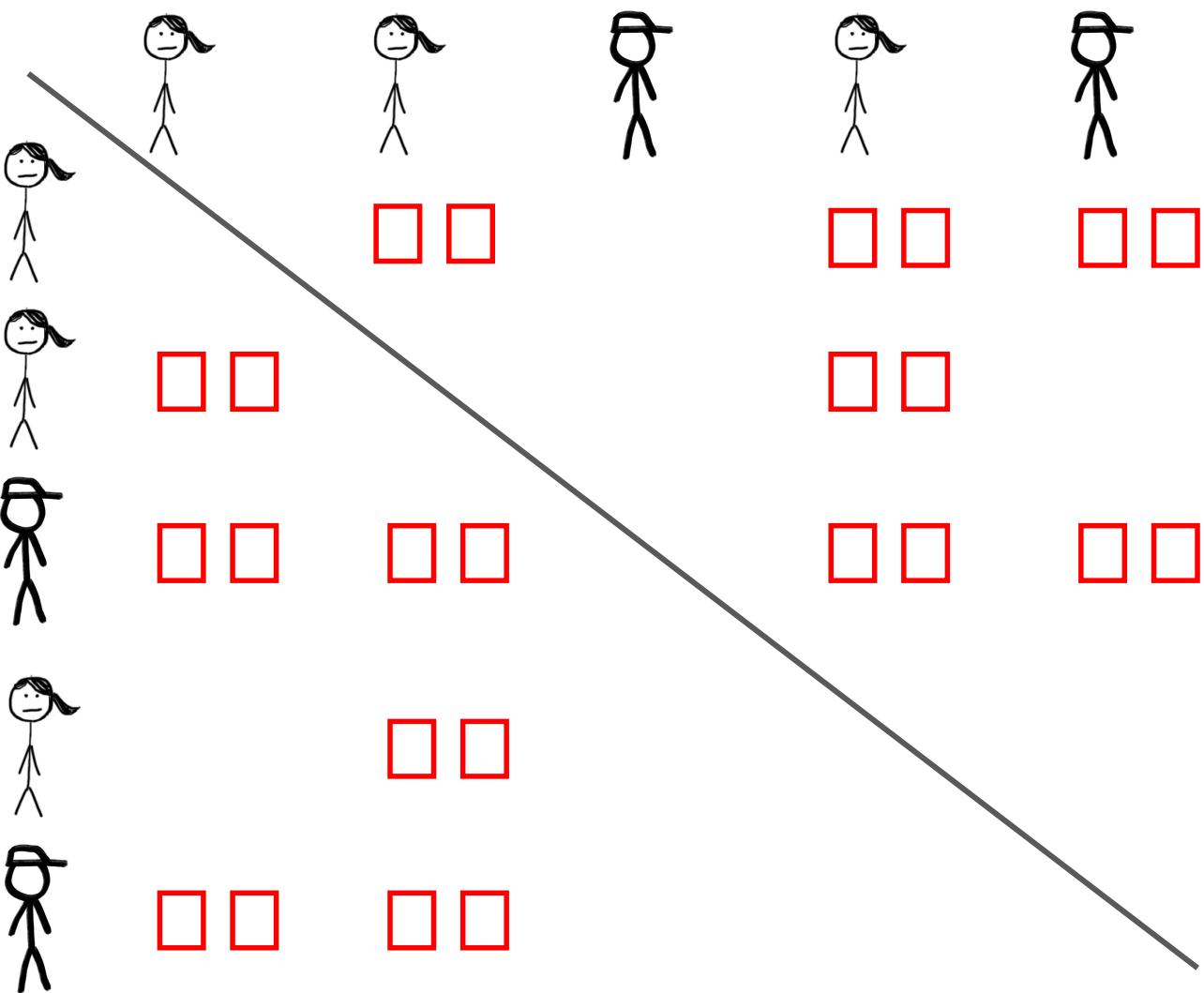
Sports



Home



Other



Are you together...

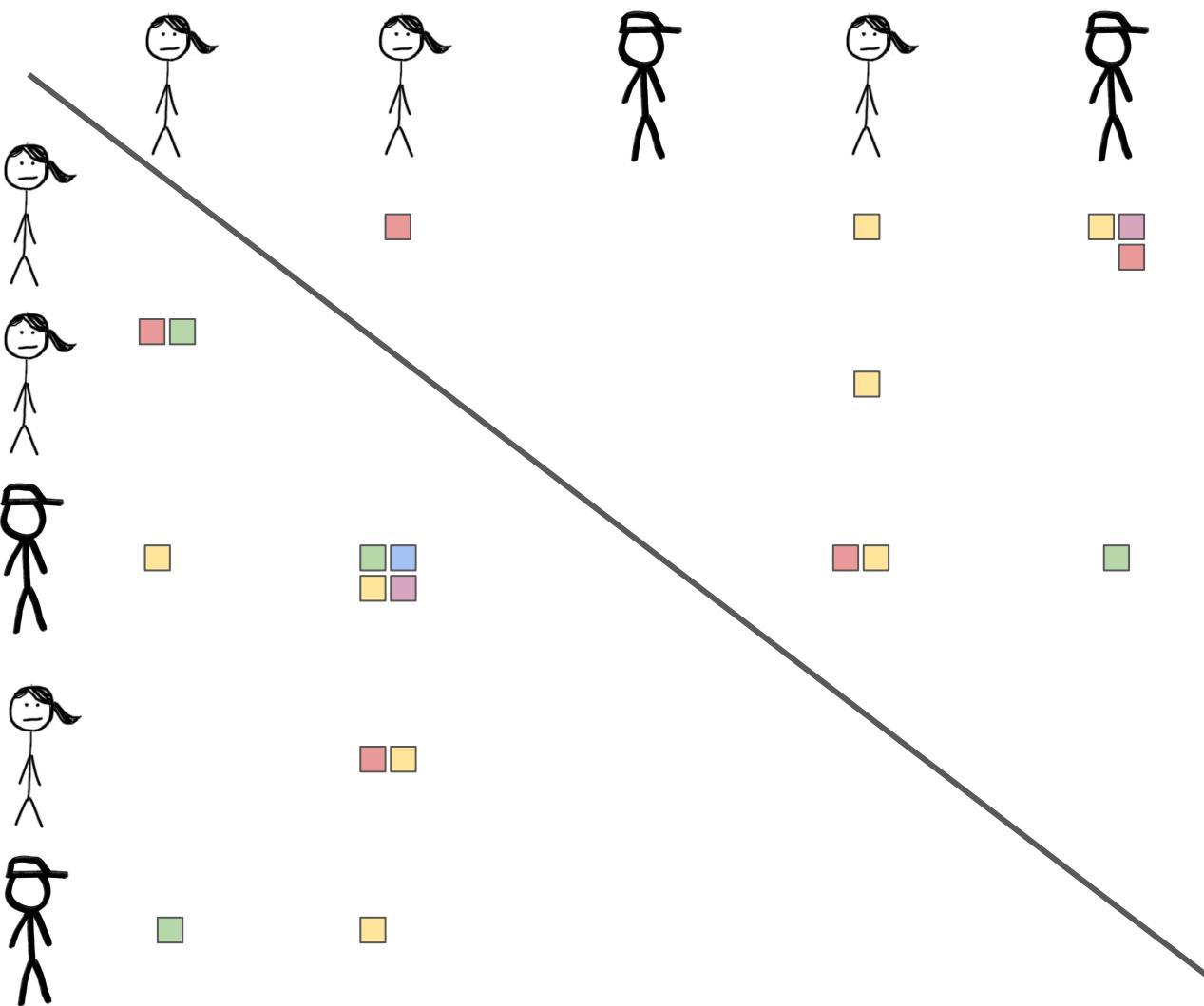
 Physically

 School

 Sports

 Home

 Other



Are you together...

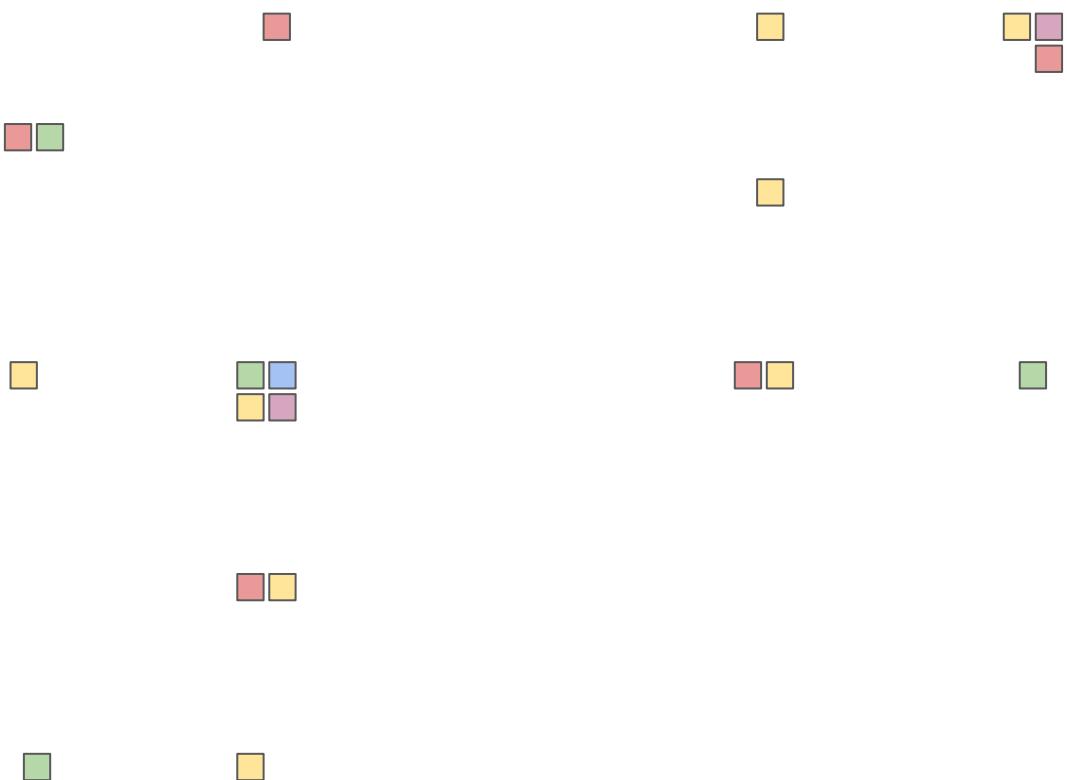
 Physically

 School

 Sports

 Home

 Other



Are you together...

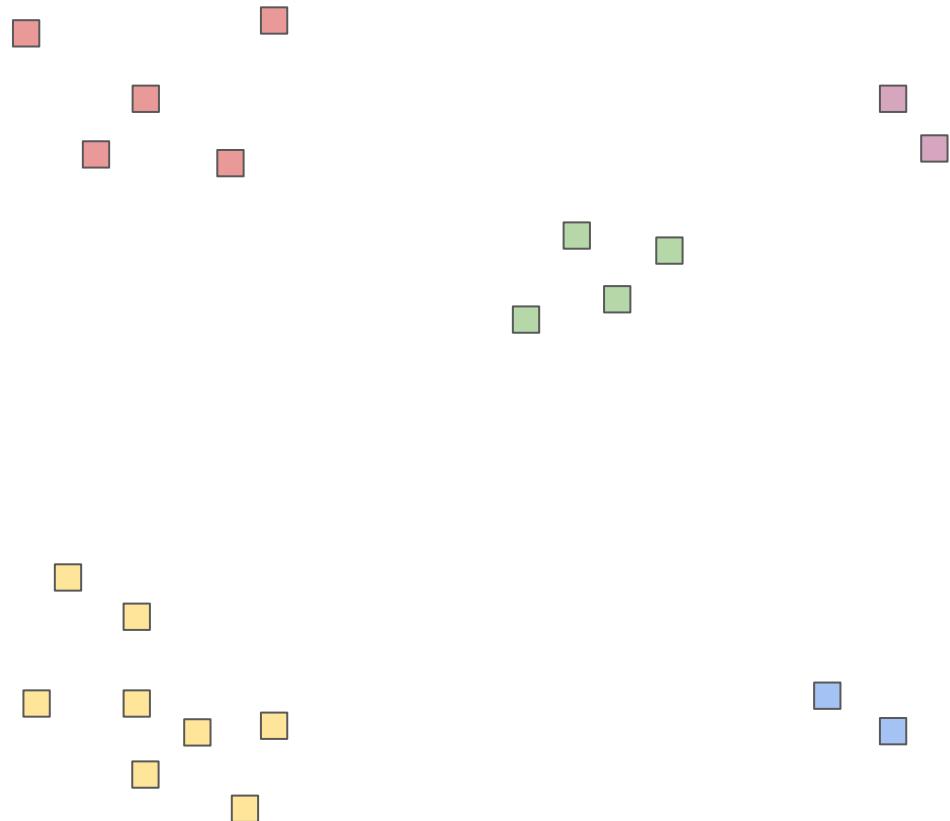
 Physically

 School

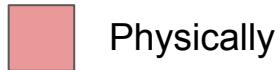
 Sports

 Home

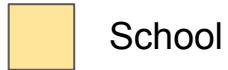
 Other



Are you together...



Physically



School



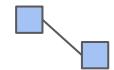
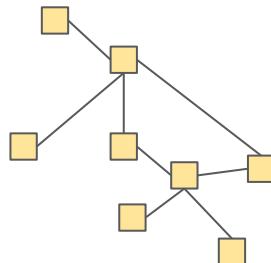
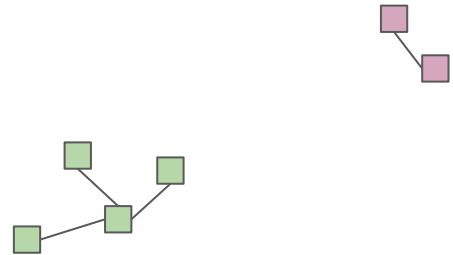
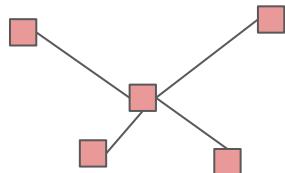
Sports



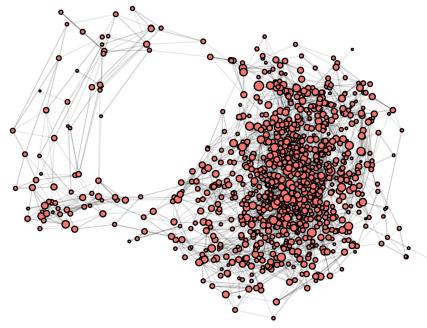
Home



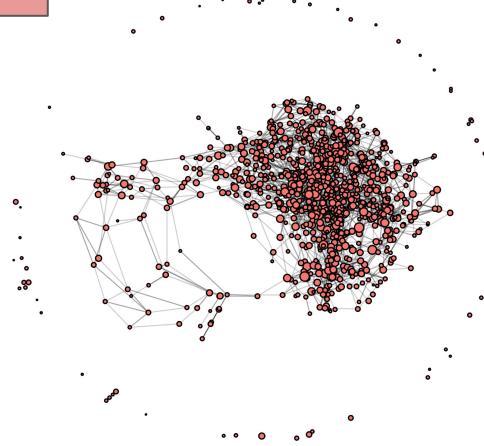
Other



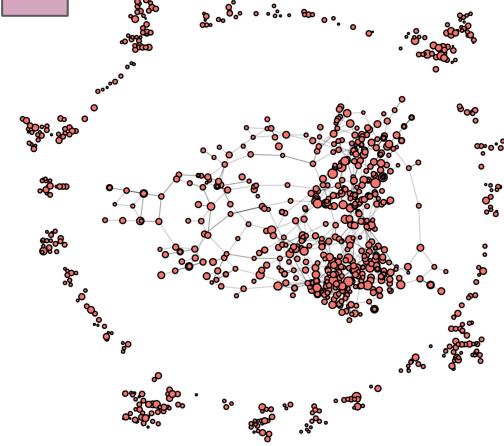
 Overall



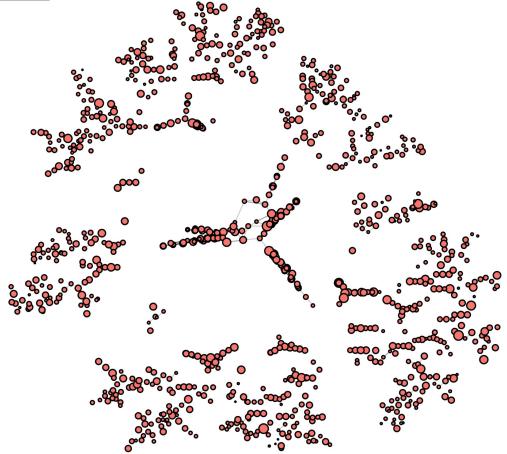
 Physically



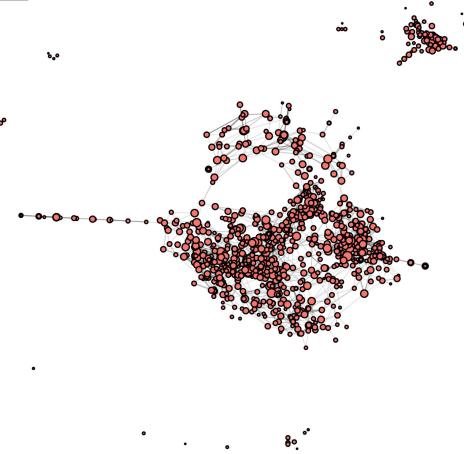
 Other



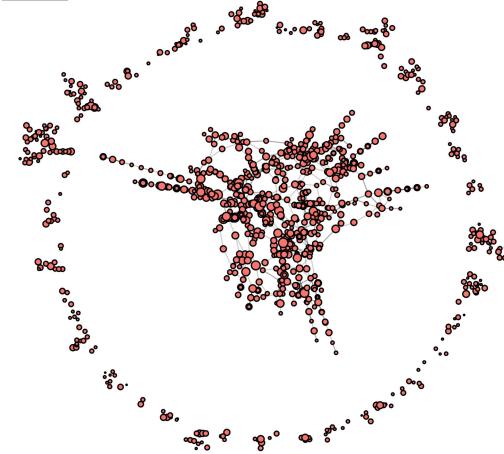
 Sports



 School



 Home

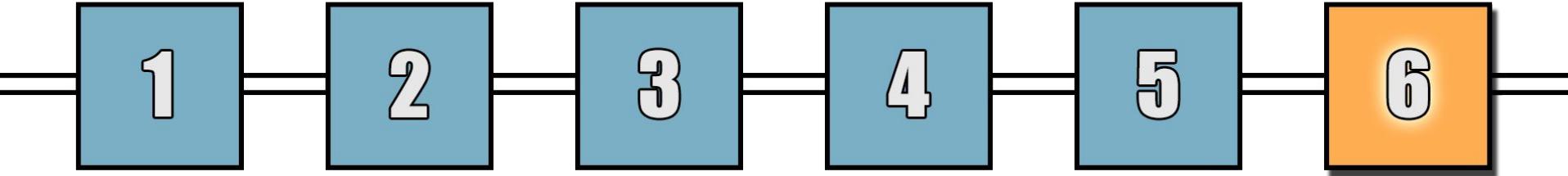


## **QUESTIONARIES:**

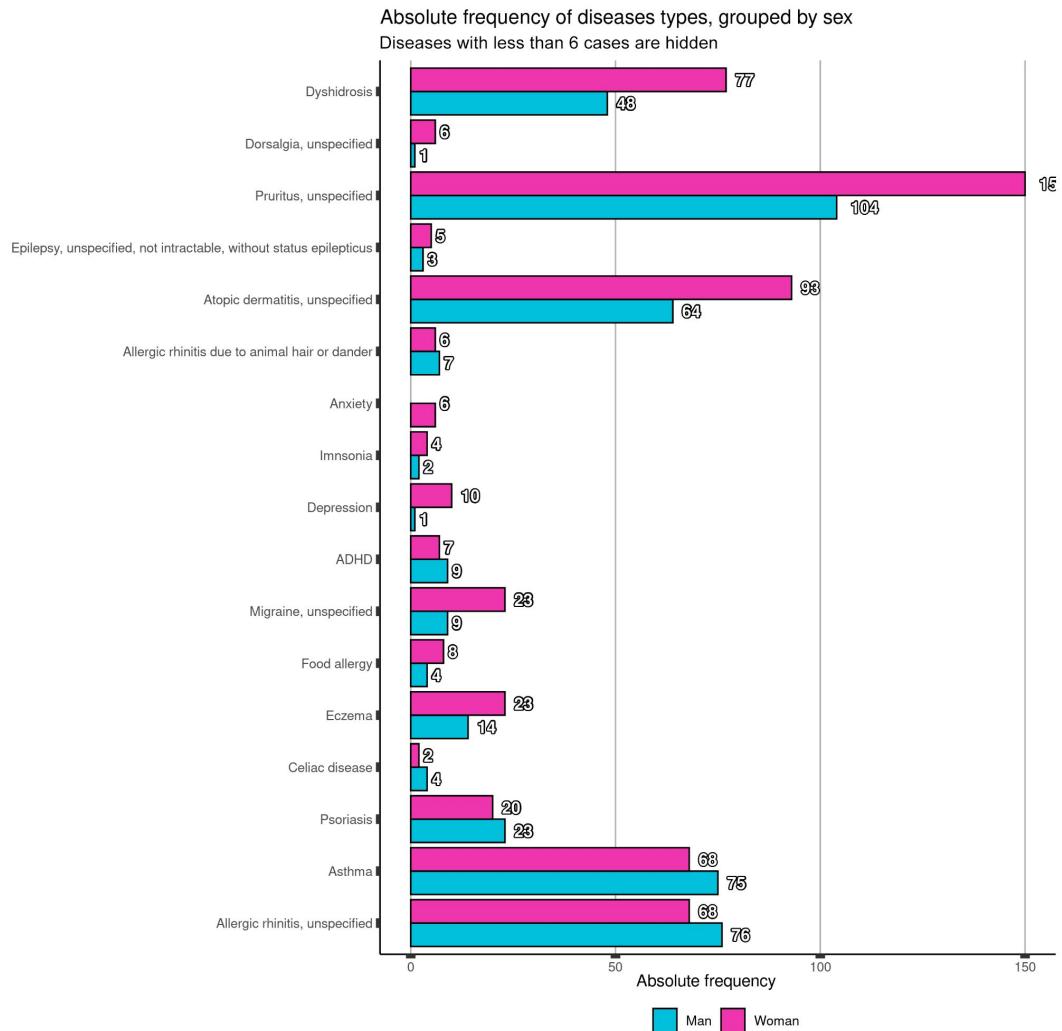
What self-reported medicines you take?

What self-reported chronic diseases you have?

Other relevant questions

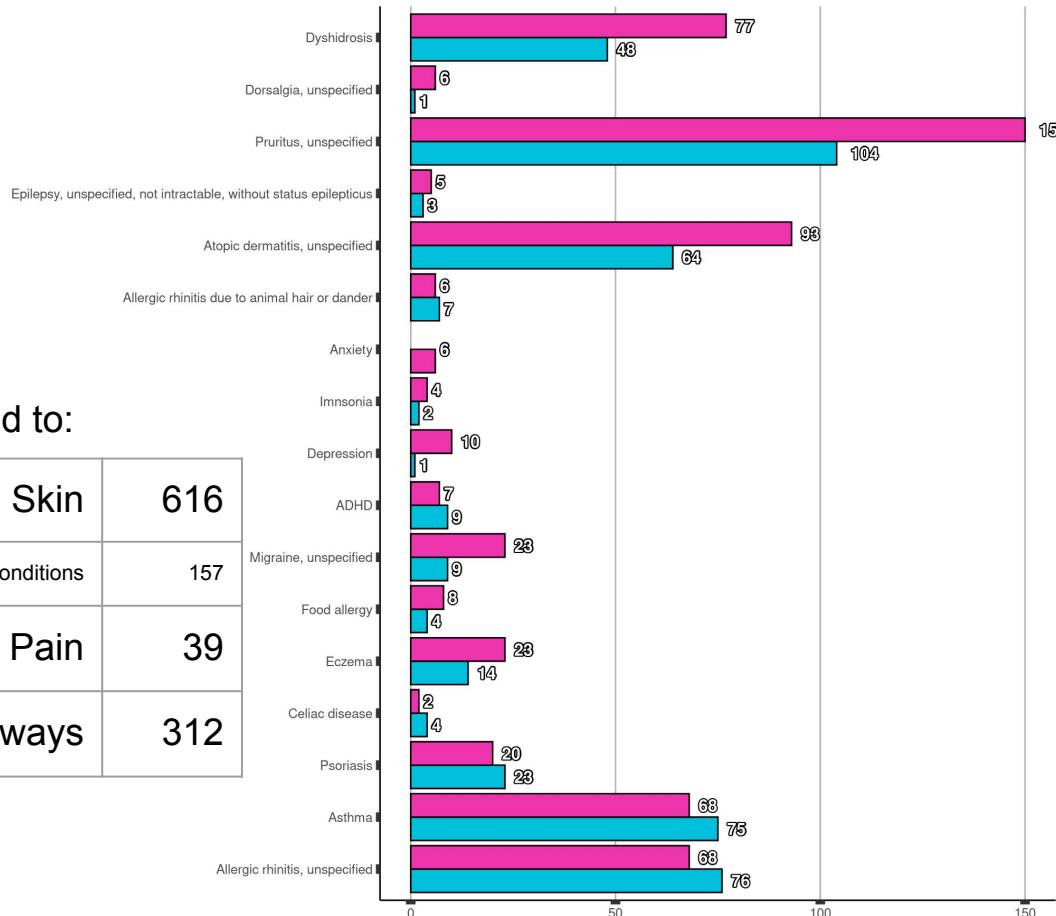


# RESULTS



Absolute frequency of diseases types, grouped by sex

Diseases with less than 6 cases are hidden

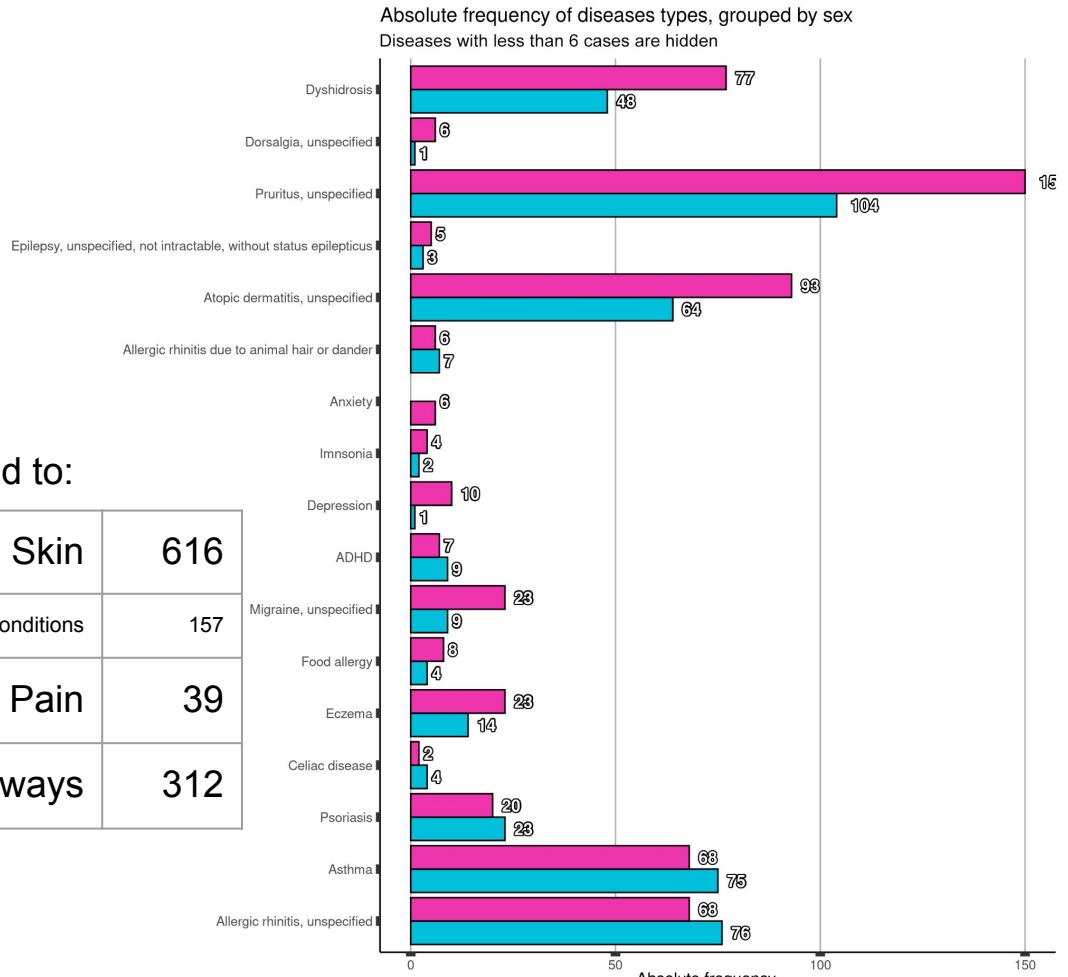


## Diseases related to:

Skin	616
Of which allergic conditions	157
Pain	39
Airways	312

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Skin	616
Of which allergic conditions	157
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Dyshidrosis (blister and dry)



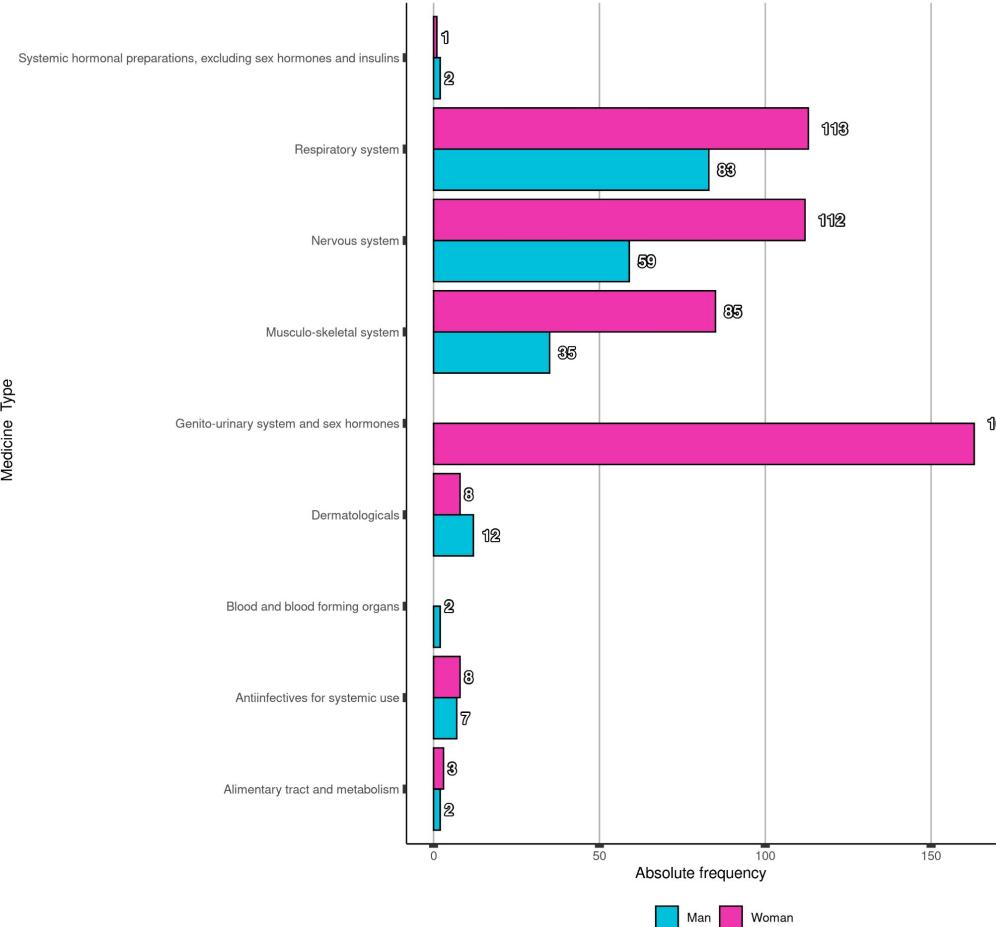
Pruritus (itchy skin)



Atopic dermatitis (allergic Eczema (others))



Absolute frequency of medicine types, grouped by sex



Absolute frequency of medicine types, grouped by sex

Systemic hormonal preparations, excluding sex hormones and insulins

Respiratory system

Nervous system

Musculo-skeletal system

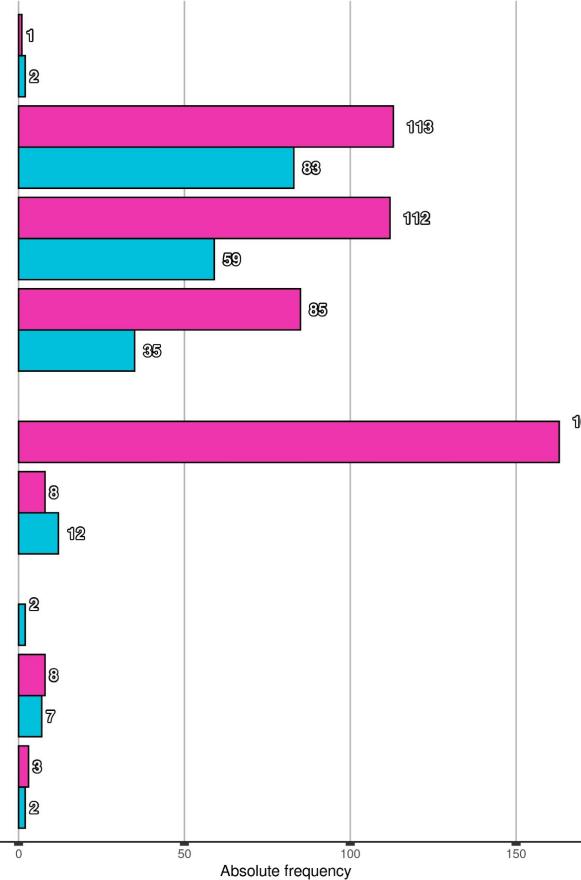
Genito-urinary system and sex hormones

Dermatologicals

Blood and blood forming organs

Antiinfectives for systemic use

Alimentary tract and metabolism



## Medicines related to:

Skin	20
Pain	291
Airways	196
Contraceptives (women only)	164

Absolute frequency of medicine types, grouped by sex

Systemic hormonal preparations, excluding sex hormones and insulins

Respiratory system

Nervous system

Musculo-skeletal system

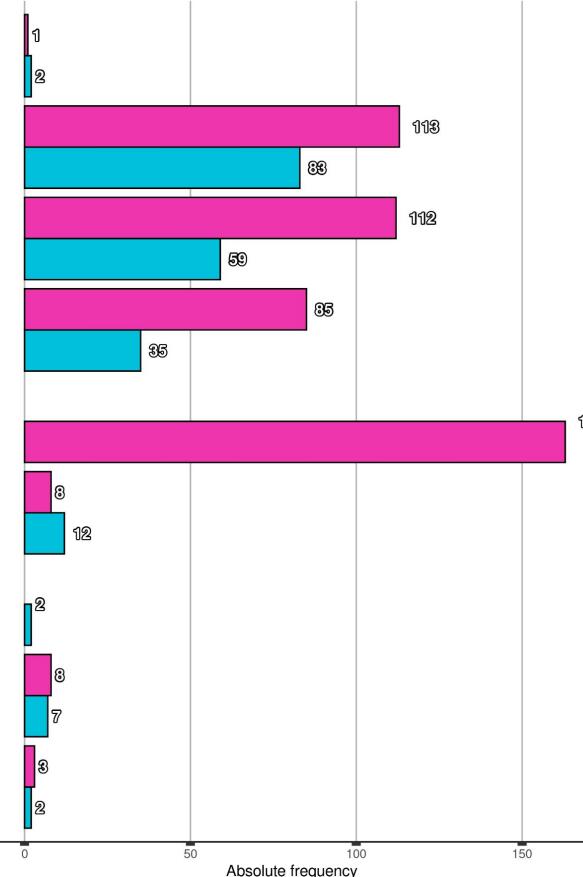
Genito-urinary system and sex hormones

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Alimentary tract and metabolism



█ Man   █ Woman

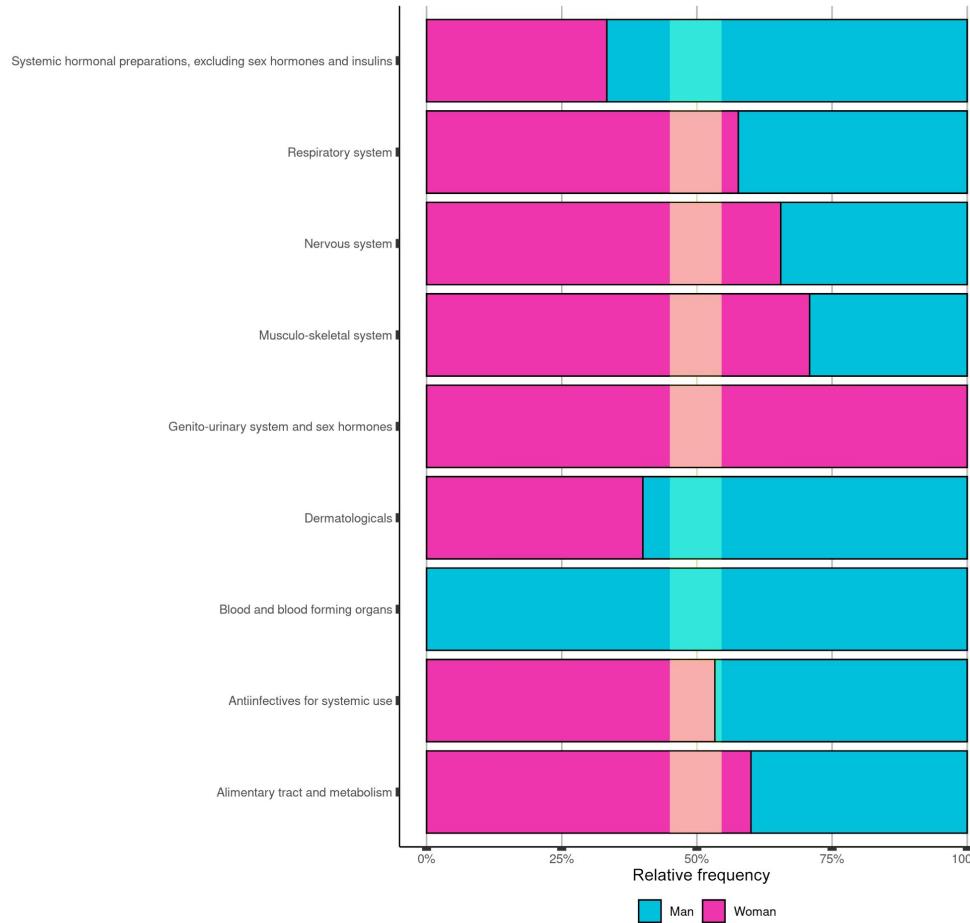
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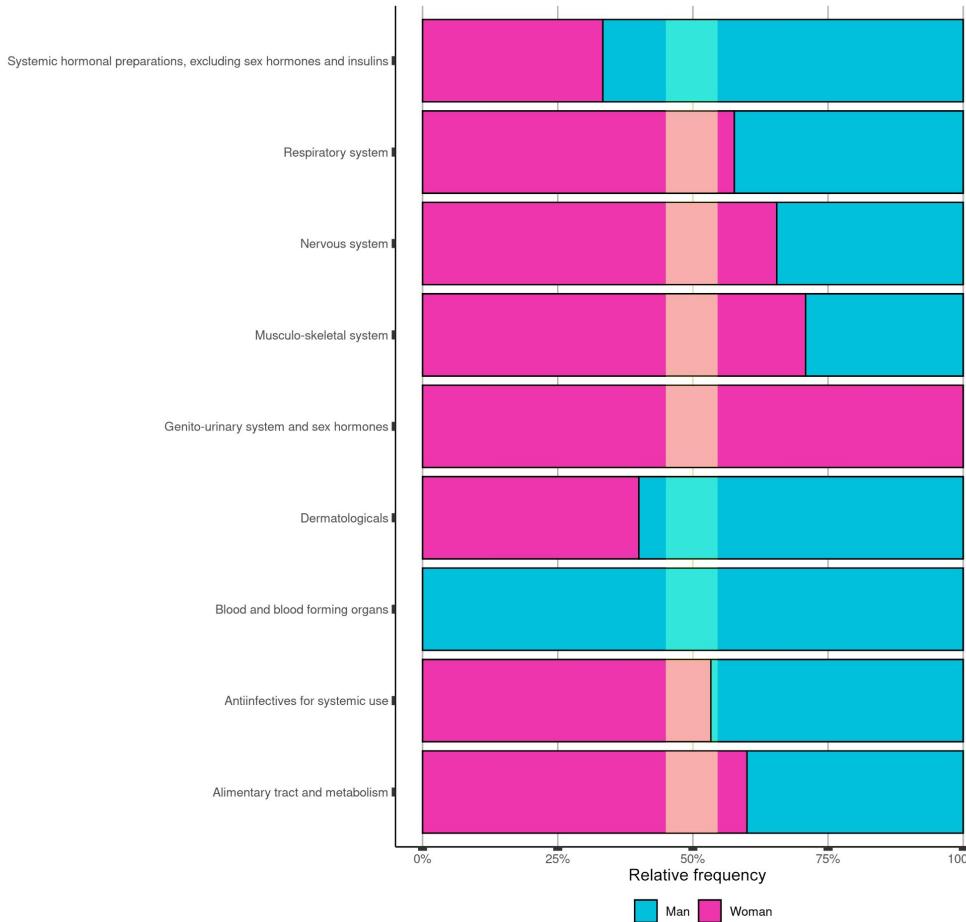
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Relative frequency of medicine types, grouped by sex



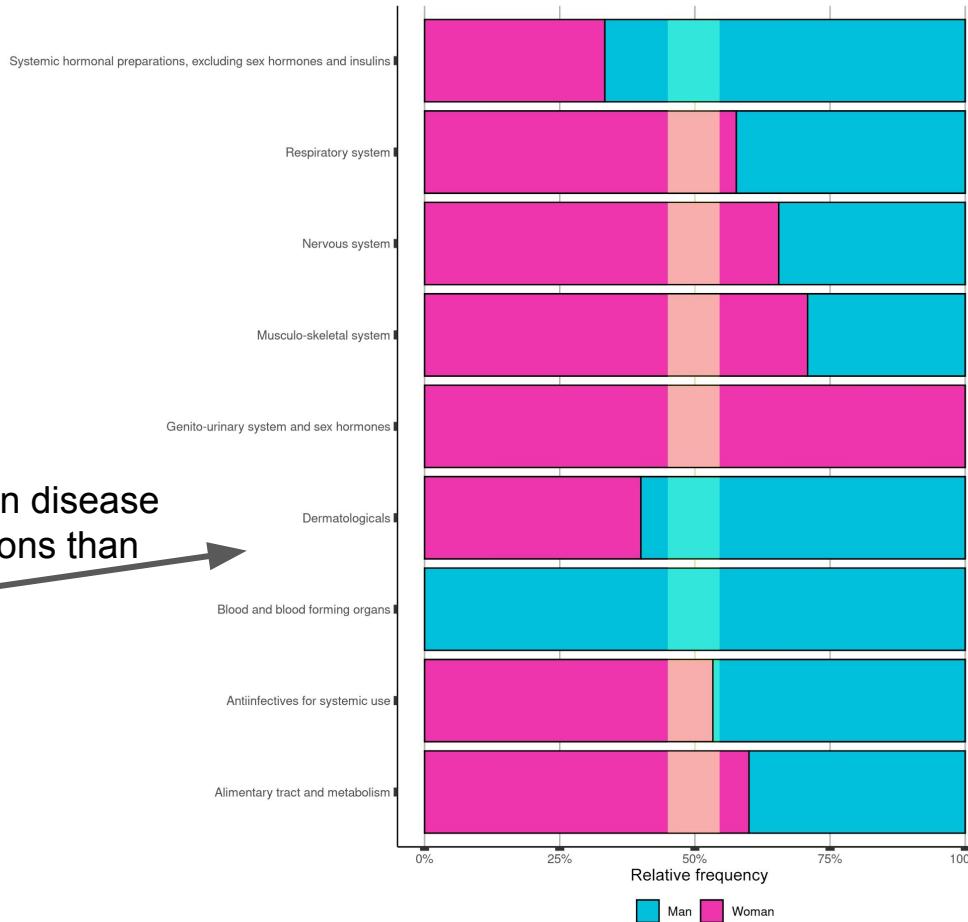
Relative frequency of medicine types, grouped by sex



Pain is low for both sexes, but women seems to take more pain related medicines



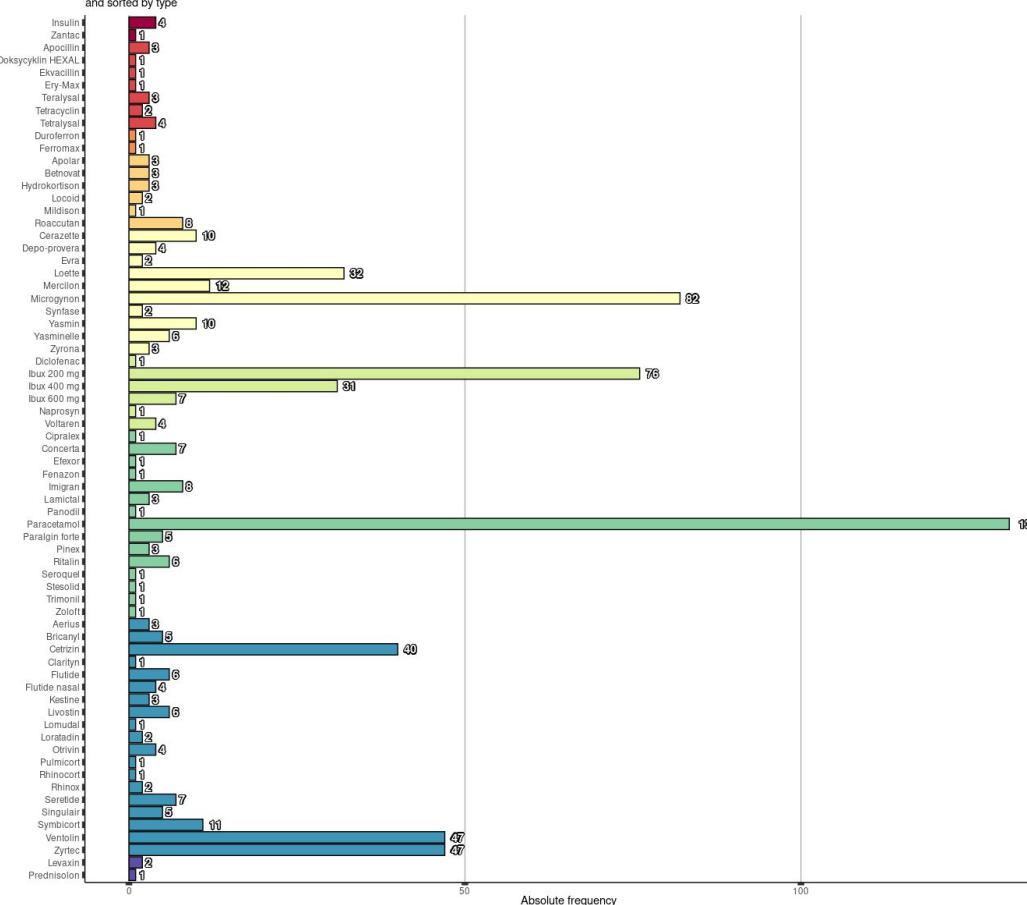
Relative frequency of medicine types, grouped by sex



Women have more skin disease  
but take less preparations than  
men

Pain is low for both sexes,  
but women seems to take  
more pain related medicines

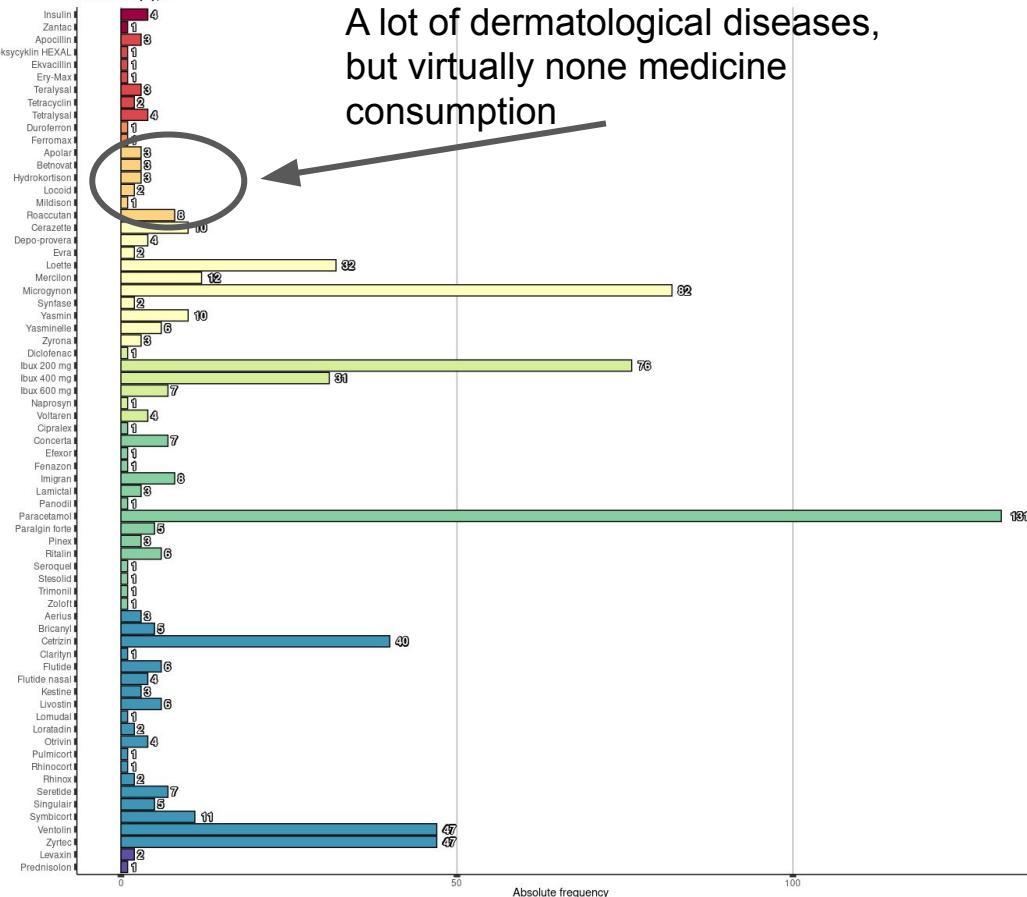
Absolute frequency of medicine brand, grouped by type  
and sorted by type



ATC Group

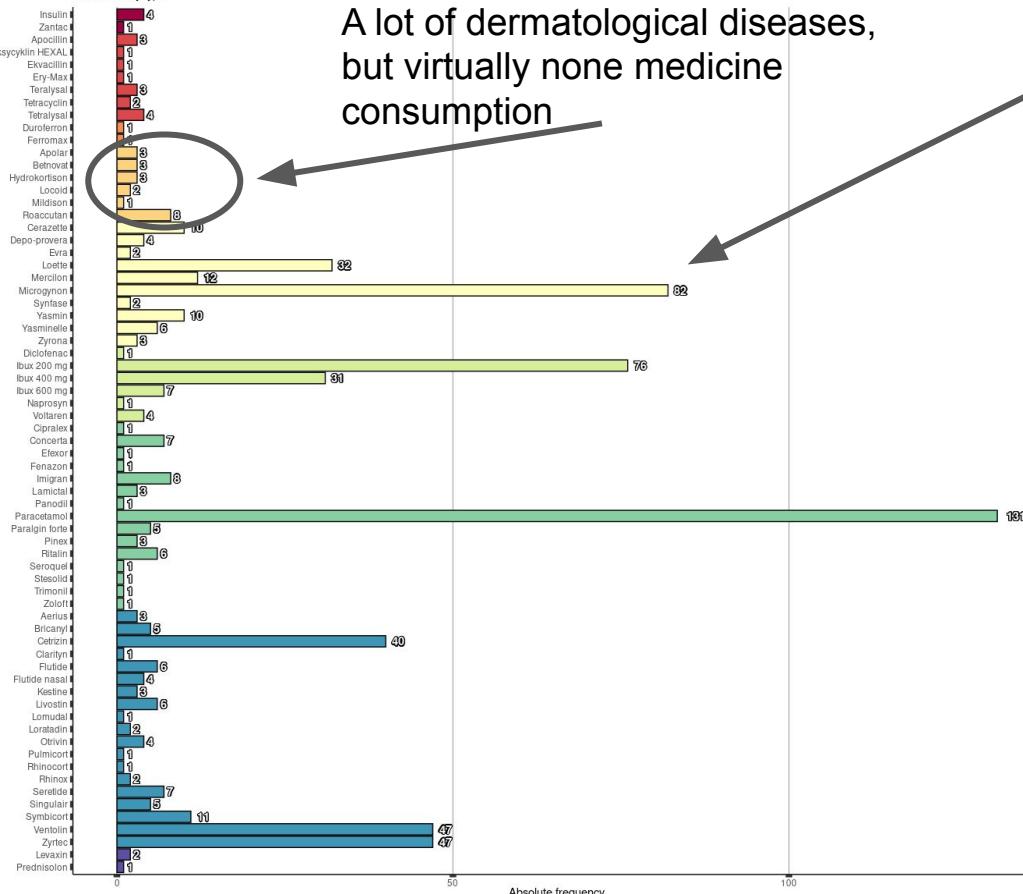
- Alimentary tract and metabolism
- Antinefectives for systemic use
- Blood and blood forming organs
- Dermatologicals
- Genito-urinary system and sex hormones
- Musculo-skeletal system
- Nervous system
- Respiratory system
- Systemic hormonal preparations, excluding sex hormones and insulin

Absolute frequency of medicine brand, grouped by type  
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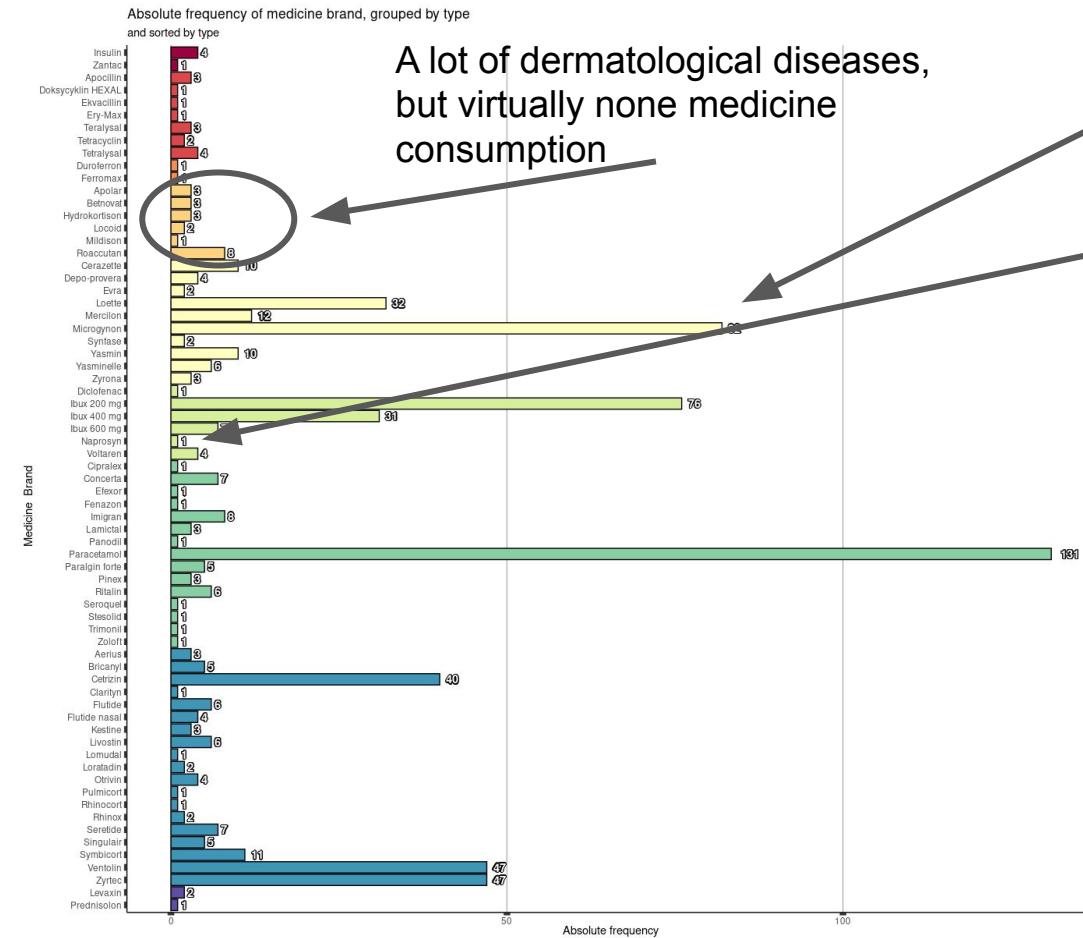
A lot of dermatological diseases,  
but virtually none medicine  
consumption

Absolute frequency of medicine brand, grouped by type  
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A lot of dermatological diseases,  
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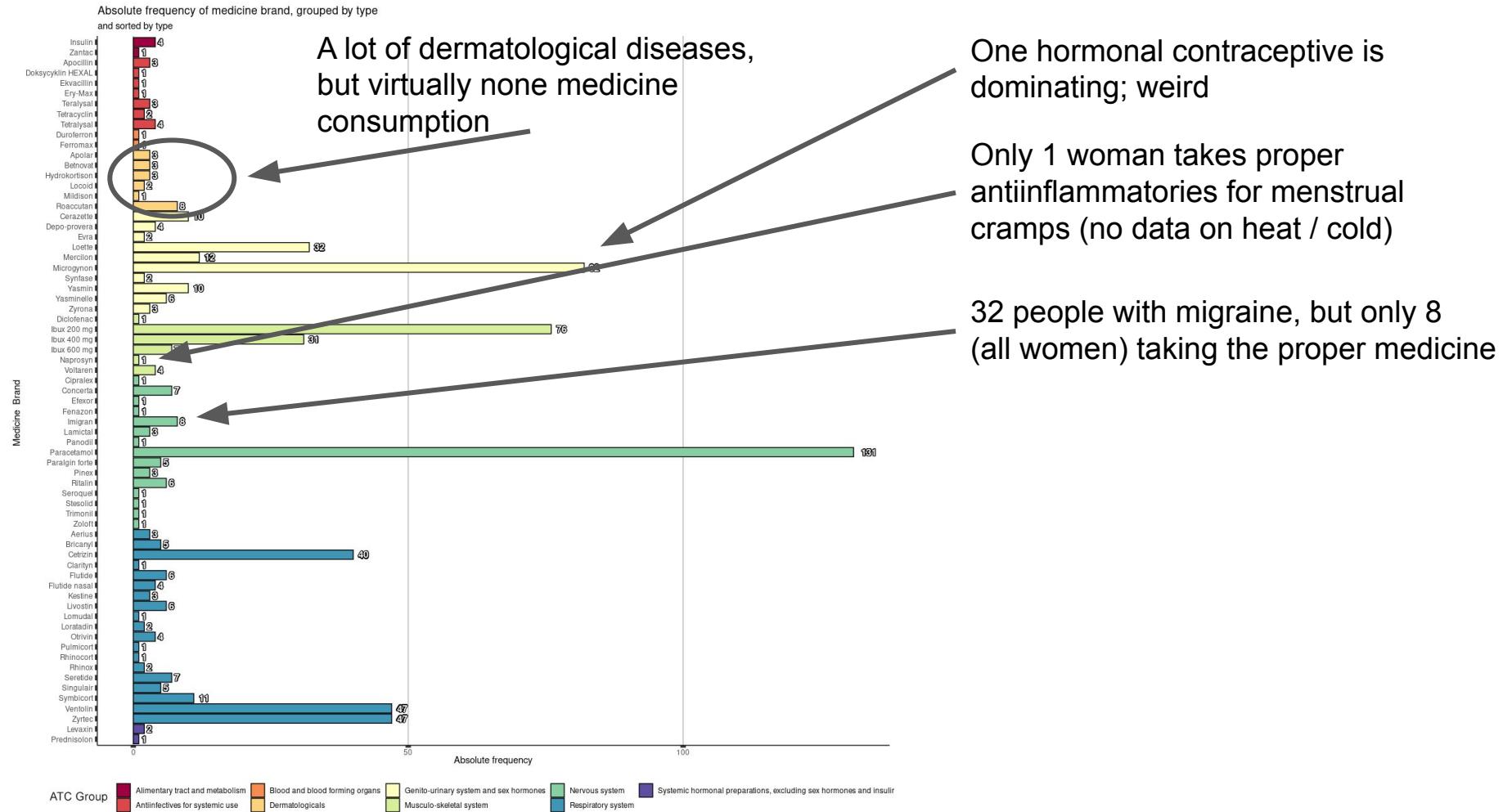
One hormonal contraceptive is  
dominating; weird

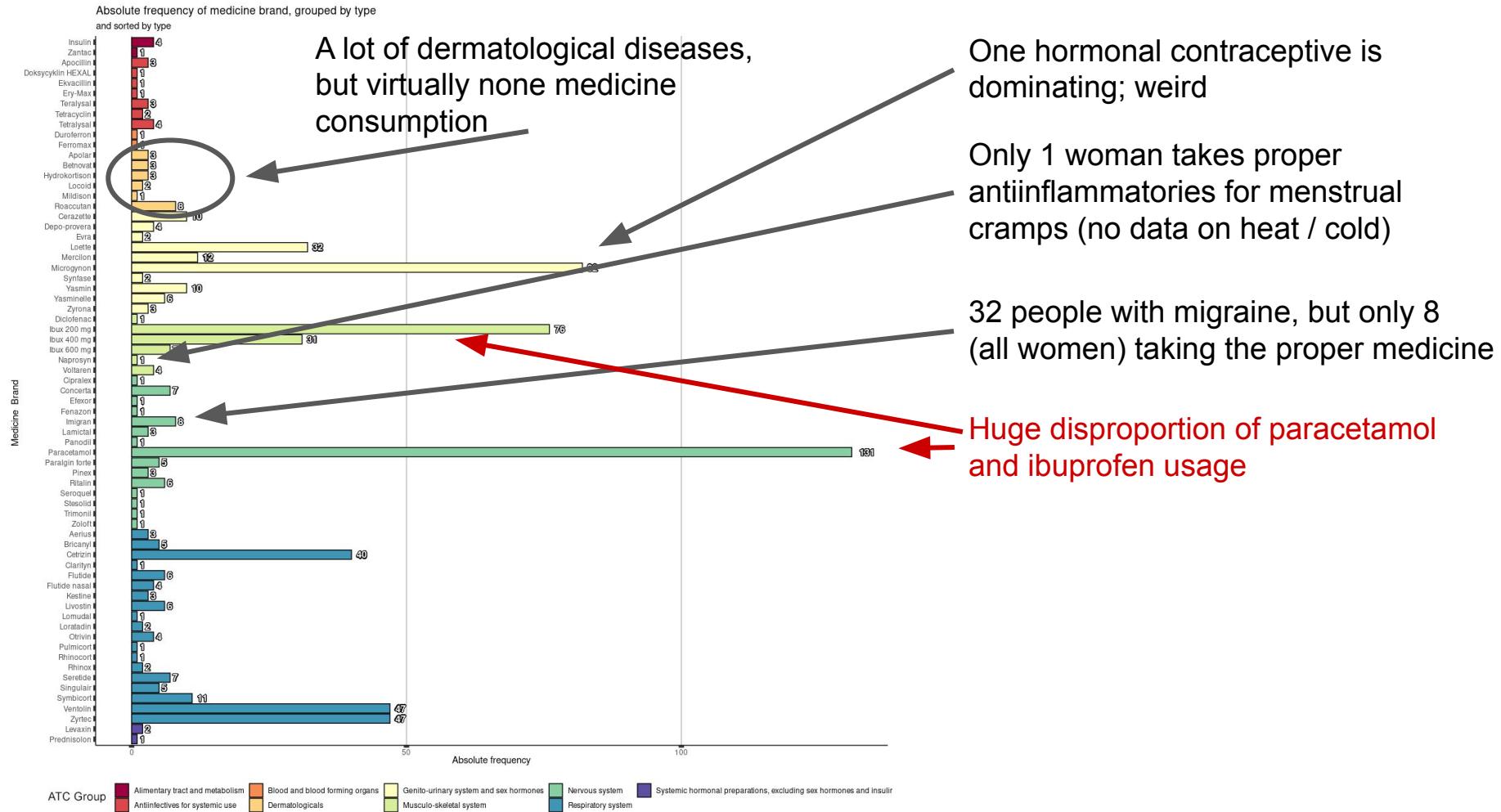


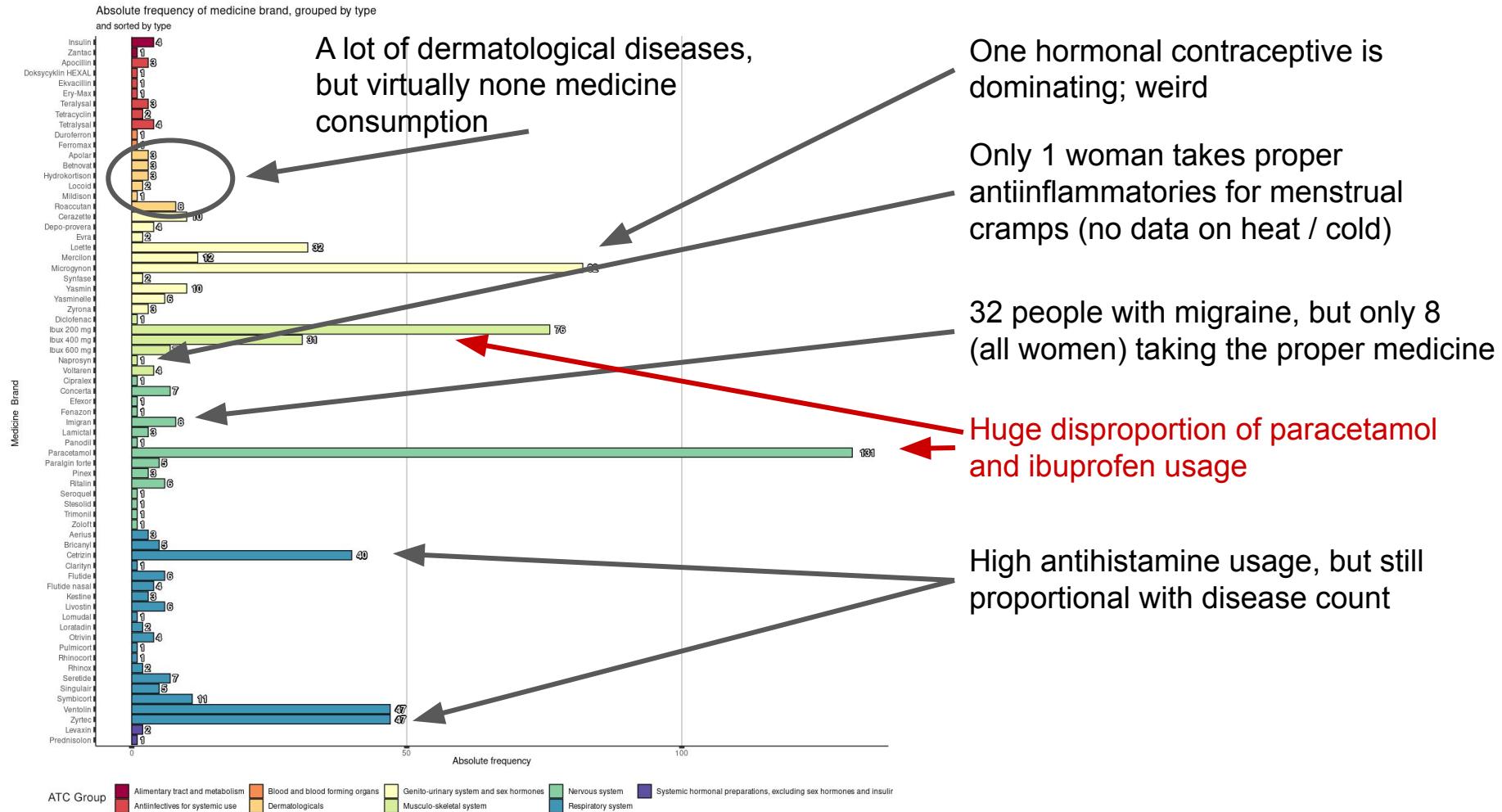
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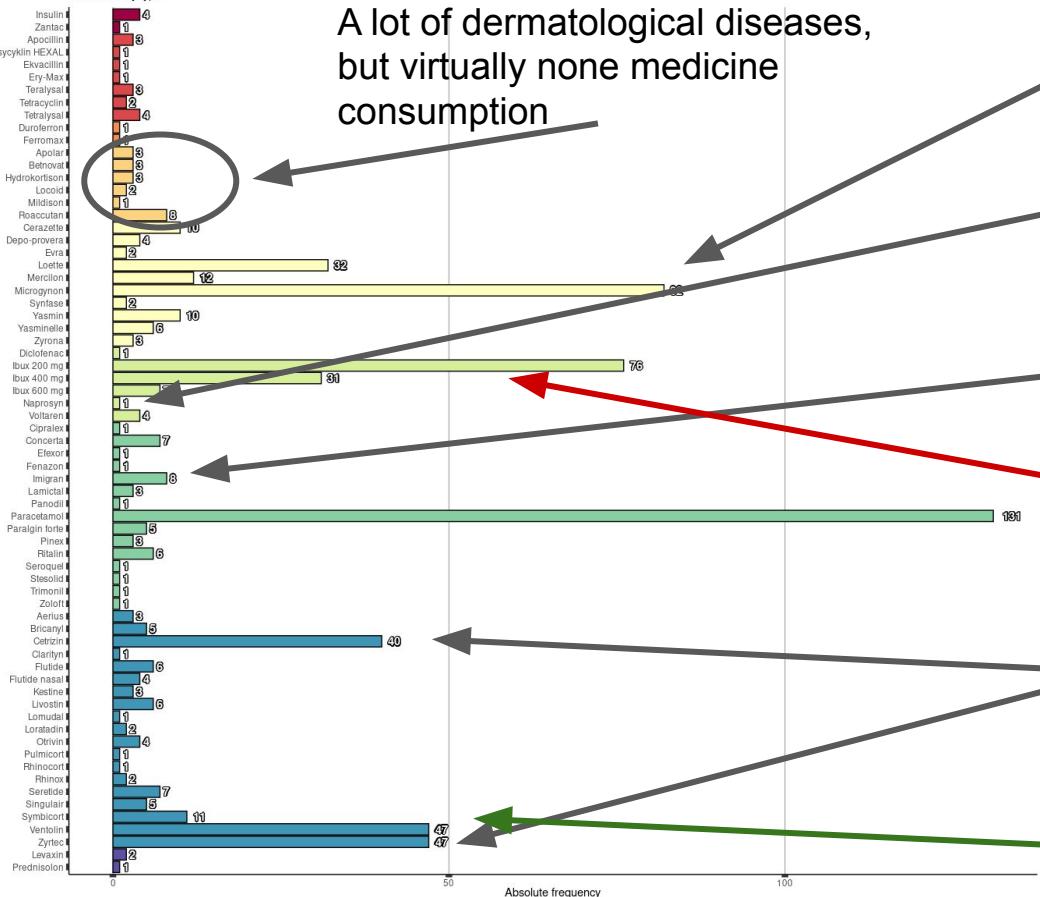
Only 1 woman takes proper  
antiinflammatories for menstrual  
cramps (no data on heat / cold)







Absolute frequency of medicine brand, grouped by type  
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but virtually none medicine  
consumption

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Only 1 woman takes proper  
antiinflammatories for menstrual  
cramps (no data on heat / cold)

32 people with migraine, but only 8  
(all women) taking the proper medicine

Huge disproportion of paracetamol  
and ibuprofen usage

High antihistamine usage, but still  
proportional with disease count

High amount of asthma but low  
usage of ventolin (salbutamol)

**Table 6.12:** Summary of the  $\chi^2$  significance for relevant medicine groups divided by bias type (high school and sex). From left to right, bias type, type of medicine, numerical significance rounded to 4 decimals, and p-value in GP Prism 5.04/d format. Hormonal contraceptives seem to be biased concerning high school. Painkillers also seem to be biased concerning high school and sex. Anti-inflammatory shows a bias concerning sex only

Bias type	Medicine	Significance	
Highschool	Hormonal contraceptives (women only)	0.0002	***
	Anti-inflammatory	0.2075	ns
	Antihistamine	0.1766	ns
	Painkiller	0.0006	***
Sex	Anti-inflammatory	0	****
	Antihistamine	0.264	ns
	Painkiller	0.0011	**

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Significant difference in  
highschools!? very weird!

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Significant difference in women, coincide with national and world thrends

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**Good news!** antihistamines seems to be consumed with responsibility in all results

Significant difference in highschools!? very weird!

Significant difference in women, coincide with national and world trends

**Hey kids**

Questions?



**Wanna buy some Paracetamol?**