



25.3.2020

# Final Report

Online international validation  
round coding of upgraded PCNE  
DRP cases using PCNE DRP  
Classification V9.00



Report compiled by Nejc Horvat

## Introduction

After upgrade of the PCNE set of DRP cases at the meeting in Heidelberg, the 2nd round expert coding took place in January 2018. Fifteen experts were invited to complete the online survey with 18 DRP cases, where Problems and Causes were coded. They used The PCNE Classification V 8.02. Nine experts fully answered the survey (9/15 = 60 % response rate). The results were analysed and presented to the members of the working group at the 2019 Working Conference in Egmond. The Classification and its validation were again discussed leading to some changes. A new domain on possible causes that can be found in seamless care (patient transfer between different settings or clinical departments) was introduced as well as some additional minor changes. The current version V9.0 went into an international validation round, in which 20-30 pharmacists per country were invited to code 20 slightly amended DRP cases. Pharmacists coded Problem(s), Cause(s) and Planned intervention(s).

Results are shown on the following pages. Each case is followed by the number of DRPs recognized, Problems (P-codes), Causes (C-codes) and Planned Interventions (I-codes) codes used. The frequencies as well as the percentages of pharmacists who used the same code is shown. Due to a large variation in C- and I-codes used, only the codes with frequency greater than 10 are shown. Consistency in coding above 80 % is considered satisfactory and is shown in green.

## Response

Data collection took place from 6. 11. 2019 to 29. 2. 2020. There were 216 completed questionnaires.

Response rate (?)		Base: Entered intro ▼
Status	Frequency	State
Entered intro	622	100%
Entered first page	334	54%
Started responding	308	50%
Partially completed	301	48%
Completed	216	35%
<b>Unit usability (50%/80%)</b>		
Usable units	214	71%
Partially usable units	2	1%
Unusable units	85	28%
<b>Breakoffs</b>		
Introductory breakoffs	304	49%
Questionnaire breakoffs	92	15% (neto 29%)
Total breakoffs	396	64%

### Terms explanation

**Entered intro:** each click to the survey is counted, irrespective of whether the survey was completed in full or if the respondent left the survey immediately after clicking on the URL.

**Entered first page:** each respondent that clicked on 'Next page' is counted.

**Partially completed:** each respondent that answered at least one question is counted.

**Completed the survey:** each respondent that answered clicked on the 'End' button on the last page of the survey is counted.

Unit usability:

**Usable units:** questionnaires where the respondent answered more than 80% of the responses

**Partially usable units:** questionnaires with 50%-80% of usable responses.

**Unusable units:** questionnaires with less than 50% of usable responses (but at least 1 question answered)

Usable units + partially usable units + unusable units = partially completed questionnaires = valid questionnaires.

Breakoffs:

The respondent stopped answering the questions and left the survey at a certain point.

**Introductory breakoffs:** breakoff after reading introduction

**Questionnaire breakoffs:** breakoffs during filling the questionnaire

**Total breakoffs:** sum of the above

**Country of practice/work (n=295)**

Country	Frequency	Percentage
Norway	47	16 %
Turkey	45	15 %
China	41	14 %
Portugal	28	9 %
Croatia	26	9 %
Serbia	26	9 %
Sweden	24	8 %
Slovenia	19	6 %
Spain	19	6 %
Poland	15	5 %
Germany	3	1 %
Mexico	2	1 %

**Language version of the PCNE-DRP-Classification used (n=297)**

Language	Frequency	Percentage
English	209	70 %
Serbian	26	9 %
Turkish	21	7 %
Spanish	20	7 %
Chinese (Mandarin)	16	5 %
Slovenian	3	1 %
German	2	1 %

**Case 1**

Mrs. A, 87 years old, has been taking digoxin 0.25 mg daily for her atrial fibrillation for 3 years. She is really getting old and smaller by the day now. It is a Saturday morning and she presents a new prescription for digoxin 0.25mg. While you prepare the prescription she tells you that she is recently suffering from strange visions and wonders if she needs her glasses replaced. You recognise the possible side-effect of the digoxin and tell her not to take the digoxin for one day and to go to the GP on Monday and present him with her complaints. She promises to do so.

Number of DRPs recognised in this case, n=238

Number of DRPs	Frequency	Percentage
1	219	92 %
2	14	6 %
3	5	2 %

The Problems codes (P-codes), n=238

P-code	Frequency (potential/manifest)	Percentage
P2.1 Adverse drug event (possibly) occurring	230 (36/193)	97 %
P1.2 Effect of drug treatment not optimal	12 (9/2)	5 %
P3.3 Unclear problem/complaint. Further clarification necessary (please use as escape only): she may suffer different symptoms other than visual problem until she see the gp	4 (2/2)	2 %
P1.3 Untreated symptoms or indication	3 (0/3)	1 %
P1.1 No effect of drug treatment	2 (1/1)	1 %

The Causes codes (C-codes), n=239

C-code	Frequency	Percentage
C3.2 Drug dose too high	183	77 %
C9.1 No or inappropriate outcome monitoring (incl. TDM)	44	18 %
C4.2 Duration of treatment too long	28	12 %
C3.4 Dosage regimen too frequent	17	7 %
C1.2 Inappropriate drug (within guidelines but otherwise contra-indicated)	13	5 %
C9.3 No obvious cause	11	5 %

The Planned Interventions codes (I-codes), n=238

I-code	Frequency	Percentage
I2.3 Patient referred to prescriber	179	75 %
I3.5 Drug paused or stopped	99	42 %
I2.1 Patient (drug) counselling	46	19 %
I1.3 Intervention proposed to prescriber	19	8 %
I1.4 Intervention discussed with prescriber	17	7 %
I3.2 Dosage changed	16	7 %

**Case 2**

Mr. B, 45 years old and regular patient, comes wheezing into your pharmacy and tells you that those symptoms started again a couple of weeks ago. He presents the first repeat prescription for his metoprolol, and a new prescription for a salmeterol aerosol. He already uses beclomethasone via inhaler, 100mcg twice a day. It is clear that he suffers from an increase of his asthma symptoms and this could be due to the metoprolol. You phone the GP, and together you decide to switch to an ACE-inhibitor for the hypertension.

Number of DRPs recognised in this case, n=229

Number of DRPs	Frequency	Percentage
1	184	80 %
2	43	19 %
3	2	1 %

The Problems codes (P-codes), n=229

P-code	Frequency (potential/manifest)	Percentage
P2.1 Adverse drug event (possibly) occurring	177 (29/148)	77 %
P1.2 Effect of drug treatment not optimal	78 (11/70)	34 %
P1.1 No effect of drug treatment	5 (3/2)	2 %
P1.3 Untreated symptoms or indication	5 (1/4)	2 %
P3.2 Unnecessary drug-treatment	2 (2/1)	1 %
P3.3 Unclear problem/complaint. Further clarification necessary (please use as escape only)	2 (0/3)	1 %

The Causes codes (C-codes), n=227

C-code	Frequency	Percentage
C1.2 Inappropriate drug (within guidelines but otherwise contra-indicated)	105	46 %
C1.4 Inappropriate combination of drugs or drugs and herbal medication or drugs and dietary supplements	88	39 %
C1.1 Inappropriate drug according to guidelines/formulary	60	26 %

The Planned Interventions codes (I-codes), n=228

I-code	Frequency	Percentage
I1.4 Intervention discussed with prescriber	178	78 %
I3.1 Drug changed	110	48 %
I1.3 Intervention proposed to prescriber	45	20 %
I2.1 Patient (drug) counselling	16	7 %

**Case 3**

Ms. C's asthma is under poor control in spite of using inhaled beclomethasone 100mcg twice a day for 5 months. She increasingly needs her beta-2 agonist, especially at 5 in the morning when she wakes up because of her asthma. You suggest that this can be due to the worsening of her asthma and that she may temporarily increase the use of the corticosteroid, and explain why. She admits that the GP has said the same, but that she does not like corticosteroids because they make you fat. You convince her of the necessity of increasing the dosage, and she says that she will do so.

Number of DRPs recognised in this case, n=223

Number of DRPs	Frequency	Percentage
1	187	84 %
2	33	15 %
3	3	1 %

The Problems codes (P-codes), n=225

P-code	Frequency (potential/manifest)	Percentage
P1.2 Effect of drug treatment not optimal	193 (17/176)	86 %
P1.3 Untreated symptoms or indication	19 (3/17)	8 %
P1.1 No effect of drug treatment	12 (1/10)	5 %
P2.1 Adverse drug event (possibly) occurring	12 (7/4)	5 %
P3.3 Unclear problem/complaint. Further clarification necessary (please use as escape only): compliance, patient refuse, problem with patient's adherence.	5 (2/3)	2 %
P3.1 Problem with cost-effectiveness of the treatment	1 (2/0)	0 %
P3.2 Unnecessary drug-treatment	1 (1/0)	0 %

The Causes codes (C-codes), n=225

C-code	Frequency	Percentage
C7.1 Patient uses/takes less drug than prescribed or does not take the drug at all	140	62 %
C3.1 Drug dose too low	123	55 %
C6.2 Drug under-administered	23	10 %
C3.3 Dosage regimen not frequent enough	14	6 %
C1.6 No or incomplete drug treatment in spite of existing indication	12	5 %

The Planned Interventions codes (I-codes), n=224

I-code	Frequency	Percentage
I2.1 Patient (drug) counselling	203	90 %
I3.2 Dosage changed	78	35 %
I2.3 Patient referred to prescriber	14	6 %

**Case 4**

During a medication review for an elderly person, Mrs. D you note that she has been prescribed paracetamol (2g/day) by one doctor and Tramacet© (paracetamol 325 mg plus tramadol 37.5 mg) 4 times a day, by another doctor. You contact the patient and tell her to stop one of the two analgesics and to contact her GP. The patient answers that she will contact her GP, but is not yet inclined to stop either medication now.

Number of DRPs recognised in this case, n=222

Number of DRPs	Frequency	Percentage
1	188	85 %
2	32	14 %
3	2	1 %

The Problems codes (P-codes), n=222

P-code	Frequency (potential/manifest)	Percentage
P2.1 Adverse drug event (possibly) occurring	167 (162/6)	75 %
P3.2 Unnecessary drug-treatment	63 (33/29)	28 %
P1.2 Effect of drug treatment not optimal	4 (3/0)	2 %
P3.1 Problem with cost-effectiveness of the treatment	3 (2/1)	1 %
P3.3 Unclear problem/complaint. Further clarification necessary (please use as escape only)	2 (3/0)	1 %
P1.3 Untreated symptoms or indication	1 (0/1)	0 %

The Causes codes (C-codes), n=223

C-code	Frequency	Percentage
C1.5 Inappropriate duplication of therapeutic group or active ingredient	169	76 %
C3.2 Drug dose too high	53	24 %
C1.7 Too many drugs prescribed for indication	28	13 %
C7.4 Patient uses unnecessary drug	19	9 %
C1.4 Inappropriate combination of drugs or drugs and herbal medication or drugs and dietary supplements	17	8 %
C8.1 No medication reconciliation at patient transfer	15	7 %

The Planned Interventions codes (I-codes), n=222

I-code	Frequency	Percentage
I2.3 Patient referred to prescriber	170	77 %
I2.1 Patient (drug) counselling	125	56 %
I3.5 Drug paused or stopped	79	36 %



**Case 5**

During a medication review, requested by Mrs. E (40 years old), she mentions that she feels a bit dizzy at times. This has been a problem for some months now and she thinks it is because of her medications. She is taking amitriptyline (10 mg in the evening) and nitrofurantoin 50 mg daily. She has been on these medicines for 1 years. You don't think the complaint has a relationship with her current medication. You convince her to go to the GP and discuss the problem.

Number of DRPs recognised in this case, n=219

Number of DRPs	Frequency	Percentage
1	203	93 %
2	15	7 %
3	1	1 %

The Problems codes (P-codes), n=219

P-code	Frequency (potential/manifest)	Percentage
P3.3 Unclear problem/complaint. Further clarification necessary (please use as escape only)	92 (35/50)	42 %
P1.3 Untreated symptoms or indication	80 (11/69)	37 %
P2.1 Adverse drug event (possibly) occurring	67 (40/30)	31 %
P3.2 Unnecessary drug-treatment	9 (7/2)	4 %
P1.2 Effect of drug treatment not optimal	6 (2/5)	3 %
P3.1 Problem with cost-effectiveness of the treatment	1 (0/1)	0 %

The Causes codes (C-codes), n=216

C-code	Frequency	Percentage
C9.3 No obvious cause	106	49 %
C1.6 No or incomplete drug treatment in spite of existing indication	36	17 %
C4.2 Duration of treatment too long	29	13 %
C9.2 Other cause; specify	20	9 %
C8.4 Insufficient clinical information about the patient	12	6 %
C1.4 Inappropriate combination of drugs or drugs and herbal medication or drugs and dietary supplements	10	5 %

The Planned Interventions codes (I-codes), n=218

I-code	Frequency	Percentage
I2.3 Patient referred to prescriber	188	86 %
I2.1 Patient (drug) counselling	28	13 %
I0.1 No intervention	10	5 %

**Case 6**

Mr. F, a 68-year-old male, arrives complaining of dizziness. It has been particularly noticeable for 1 – 2 weeks now. All he takes since a couple of weeks is a Vitamin tonic which he buys in a drug-store, (three times a day 30ml) and he admits that he has bad eating habits. You suspect that the alcohol content, although low, of the tonic gives problems, and suggest him to use multivitamin tablets instead of the tonic. He agrees to replace the potion with the tablets.

Number of DRPs recognised in this case, n=218

Number of DRPs	Frequency	Percentage
1	206	95 %
2	11	5 %
3	1	1 %

The Problems codes (P-codes), n=218

P-code	Frequency (potential/manifest)	Percentage
P2.1 Adverse drug event (possibly) occurring	205 (42/162)	94 %
P3.3 Unclear problem/complaint. Further clarification necessary (please use as escape only)	8 (4/4)	4 %
P1.2 Effect of drug treatment not optimal	7 (3/4)	3 %
P1.3 Untreated symptoms or indication	4 (3/1)	2 %
P1.1 No effect of drug treatment	3 (1/2)	1 %
P3.2 Unnecessary drug-treatment	1 (1/1)	0 %

The Causes codes (C-codes), n=218

C-code	Frequency	Percentage
C2.1 Inappropriate drug form (for this patient)	160	73 %
C1.4 Inappropriate combination of drugs or drugs and herbal medication or drugs and dietary supplements	18	8 %
C1.1 Inappropriate drug according to guidelines/formulary	11	5 %
C1.2 Inappropriate drug (within guidelines but otherwise contra-indicated)	11	5 %
C9.2 Other cause; specify	11	5 %

The Planned Interventions codes (I-codes), n=217

I-code	Frequency	Percentage
I2.1 Patient (drug) counselling	144	63 %
I3.3 Formulation changed	129	59 %
I3.1 Drug changed	31	14 %

**Case 7**

An elderly person, Mr. G. wishes to buy ibuprofen OTC because he has painful joints. He has been taking warfarin 2 mg each night for 6 months, plus digoxin 0.0625mg in the morning. You suggest the use of paracetamol. The patient agrees, but will also go to the GP to discuss the issue.

Number of DRPs recognised in this case, n=219

Number of DRPs	Frequency	Percentage
1	193	88 %
2	23	11 %
3	3	1 %

The Problems codes (P-codes), n=219

P-code	Frequency (potential/manifest)	Percentage
P2.1 Adverse drug event (possibly) occurring	198 (193/5)	90 %
P1.3 Untreated symptoms or indication	18 (2/16)	8 %
P1.2 Effect of drug treatment not optimal	15 (13/2)	7 %
P3.2 Unnecessary drug-treatment	5 (4/1)	2 %
P1.1 No effect of drug treatment	1 (1/0)	0 %
P3.1 Problem with cost-effectiveness of the treatment	1 (1/0)	0 %

The Causes codes (C-codes), n=219

C-code	Frequency	Percentage
C1.4 Inappropriate combination of drugs or drugs and herbal medication or drugs and dietary supplements	165	75 %
C1.1 Inappropriate drug according to guidelines/formulary	49	22 %
C1.2 Inappropriate drug (within guidelines but otherwise contra-indicated)	27	12 %

The Planned Interventions codes (I-codes), n=218

I-code	Frequency	Percentage
I2.1 Patient (drug) counselling	163	75 %
I3.1 Drug changed	127	58 %
I2.3 Patient referred to prescriber	46	21 %

**Case 8**

A 34-year-old woman, Mrs. H. wants something for a very severe headache. She is 4 months pregnant. You think that it may be preeclampsia, so you refer her urgently to her GP.

Number of DRPs recognised in this case, n=215

Number of DRPs	Frequency	Percentage
1	210	98 %
2	5	3 %

The Problems codes (P-codes), n=216

P-code	Frequency (potential/manifest)	Percentage
P1.3 Untreated symptoms or indication	136 (28/106)	63 %
P3.3 Unclear problem/complaint. Further clarification necessary (please use as escape only)	59 (23/36)	27 %
P2.1 Adverse drug event (possibly) occurring	16 (13/4)	7 %
P3.2 Unnecessary drug-treatment	15 (9/6)	7 %
P1.1 No effect of drug treatment	5 (3/2)	2 %
P1.2 Effect of drug treatment not optimal	2 (2/0)	1 %

The Causes codes (C-codes), n=213

C-code	Frequency	Percentage
C1.6 No or incomplete drug treatment in spite of existing indication	73	34 %
C9.2 Other cause; specify	60	28 %
C9.3 No obvious cause	35	16 %
C1.3 No indication for drug	16	8 %
C8.4 Insufficient clinical information about the patient	14	7 %
C1.1 Inappropriate drug according to guidelines/formulary	13	6 %
C6.4 Drug not administered at all	10	5 %

The Planned Interventions codes (I-codes), n=216

I-code	Frequency	Percentage
I2.3 Patient referred to prescriber	184	85 %
I2.1 Patient (drug) counselling	22	10 %
I4.1 Other intervention (specify)	16	7 %

**Case 9**

Mr. I comes into the pharmacy and would like something for a sore throat. He complains of a very sore, burning sensation at the base of his throat which occasionally poses problems and he thinks it is some viral infection. The only medicine he has taken recently was a NSAID, which he takes for his painful legs, before going to sleep. You suspect local inflammation because of the NSAID getting stuck in his throat and explain to him that he should take the NSAID while sitting or standing up with a lot of water, after dinner preferably. He will try this.

Number of DRPs recognised in this case, n=218

Number of DRPs	Frequency	Percentage
1	210	96 %
2	8	5 %

The Problems codes (P-codes), n=217

P-code	Frequency (potential/manifest)	Percentage
P2.1 Adverse drug event (possibly) occurring	196 (29/164)	90 %
P1.2 Effect of drug treatment not optimal	11 (3/8)	5 %
P3.3 Unclear problem/complaint. Further clarification necessary (please use as escape only)	10 (1/9)	5 %
P1.1 No effect of drug treatment	3 (0/2)	1 %
P1.3 Untreated symptoms or indication	3 (2/2)	1 %

The Causes codes (C-codes), n=216

C-code	Frequency	Percentage
C7.8 Patient administers/uses the drug in a wrong way	155	72 %
C6.1 Inappropriate timing of administration and/or dosing intervals	25	12 %
C7.7 Inappropriate timing or dosing intervals	22	10 %
C6.5 Wrong drug administered	14	6 %
C6.6 Drug administered via wrong route	11	5 %
C2.1 Inappropriate drug form (for this patient)	11	5 %
C5.2 Necessary information not provided	10	5 %

The Planned Interventions codes (I-codes), n=216

I-code	Frequency	Percentage
I2.1 Patient (drug) counselling	195	90 %
I3.4 Instructions for use changed	83	38 %

**Case 10**

Mrs. J has been taking ranitidine 150 mg twice a day for 2 years. From the Drug Utilisation Evaluation (DUE) you see that she had eradication therapy 4 months ago and therefore she should not need the ranitidine anymore. You contact the GP to suggest a check on her *Helicobacter pylori* status and a gradual decrease of the ranitidine. He rejects your suggestion saying 'I just cannot force such people to stop their medication, although they indeed do not need it anymore'.

Number of DRPs recognised in this case, n=217

Number of DRPs	Frequency	Percentage
1	194	89 %
2	22	10 %
3	1	1 %

The Problems codes (P-codes), n=217

P-code	Frequency (potential/manifest)	Percentage
P3.2 Unnecessary drug-treatment	169 (89/78)	78 %
P2.1 Adverse drug event (possibly) occurring	35 (33/2)	16 %
P1.1 No effect of drug treatment	15 (11/6)	7 %
P1.2 Effect of drug treatment not optimal	8 (8/3)	4 %
P1.3 Untreated symptoms or indication	7 (4/3)	3 %
P3.1 Problem with cost-effectiveness of the treatment	4 (2/3)	2 %

The Causes codes (C-codes), n=217

C-code	Frequency	Percentage
C4.2 Duration of treatment too long	125	57 %
C1.3 No indication for drug	93	43 %
C7.4 Patient uses unnecessary drug	51	24 %
C1.1 Inappropriate drug according to guidelines/formulary	14	6 %

The Planned Interventions codes (I-codes), n=216

I-code	Frequency	Percentage
I1.3 Intervention proposed to prescriber	145	67 %
I1.4 Intervention discussed with prescriber	72	33 %
I3.5 Drug paused or stopped	24	11 %
I2.1 Patient (drug) counselling	22	10 %

**Case 11**

Ms. K, 84 years old, arrives complaining of oral thrush. She is a chronic asthmatic using inhaled corticosteroids. You check her inhaler technique and notice that she does not inhale properly at all and does not swash her mouth after inhalation. So you give her an inhaler instruction with an inhaler chamber, and tell her to swash her mouth with water after inhaling. She returns after a week and her thrush has disappeared.

Number of DRPs recognised in this case, n=217

Number of DRPs	Frequency	Percentage
1	181	83 %
2	34	16 %
3	2	1 %

The Problems codes (P-codes), n=217

P-code	Frequency (potential/manifest)	Percentage
P2.1 Adverse drug event (possibly) occurring	204 (10/193)	94 %
P1.2 Effect of drug treatment not optimal	34 (18/15)	16 %
P1.3 Untreated symptoms or indication	4 (1/3)	2 %
P1.1 No effect of drug treatment	3 (2/1)	1 %
P3.1 Problem with cost-effectiveness of the treatment	1 (0/1)	0 %
P3.3 Unclear problem/complaint. Further clarification necessary (please use as escape only)	1 (0/1)	0 %

The Causes codes (C-codes), n=216

C-code	Frequency	Percentage
C7.8 Patient administers/uses the drug in a wrong way	166	77 %
C7.9 Patient unable to use drug/form as directed	51	24 %
C5.2 Necessary information not provided	16	7 %
C7.10 Patient unable to understand instructions properly	15	7 %
C6.5 Wrong drug administered	11	5 %
C2.1 Inappropriate drug form (for this patient)	10	5 %

The Planned Interventions codes (I-codes), n=216

I-code	Frequency	Percentage
I2.1 Patient (drug) counselling	202	94 %
I3.4 Instructions for use changed	93	43 %
I2.2 Written information provided (only)	12	6 %
I4.1 Other intervention (specify)	10	5 %

**Case 12**

Ms. L, 74 years old, visits your pharmacy. She mentions that she has just been discharged from the Geriatrics department, with 'this paper' (but no verbal information). She shows you the discharge medication list she received from the hospital and asks what she should do with the rest of the atorvastatin (Lipitor) 20 mg, which is no longer on the list. She is unsure whether she should stop taking atorvastatin 20 mg. Atorvastatin is indeed missing from the list, and no other statin seems to have been prescribed. You decide to call the treating physician in the hospital for further information about the treatment plan. He confirms the omission, and indicates that she should keep on taking the atorvastatin.

Number of DRPs recognised in this case, n=215

Number of DRPs	Frequency	Percentage
1	206	96 %
2	8	4 %
3	1	1 %

The Problems codes (P-codes), n=215

P-code	Frequency (potential/manifest)	Percentage
P1.3 Untreated symptoms or indication	150 (102/47)	70 %
P3.3 Unclear problem/complaint. Further clarification necessary (please use as escape only)	41 (25/17)	19 %
P1.1 No effect of drug treatment	12 (10/2)	6 %
P1.2 Effect of drug treatment not optimal	12 (7/6)	6 %
P2.1 Adverse drug event (possibly) occurring	4 (2/3)	2 %
P3.2 Unnecessary drug-treatment	4 (2/2)	2 %

The Causes codes (C-codes), n=215

C-code	Frequency	Percentage
C8.3 Discharge/transfer information about medication incomplete or missing	132	61 %
C1.6 No or incomplete drug treatment in spite of existing indication	71	33 %
C8.5 Patient has not received necessary medication at discharge from hospital or clinic	47	22 %
C8.1 No medication reconciliation at patient transfer	28	13 %
C8.2 No updated medication list available	13	6 %
C6.4 Drug not administered at all	12	6 %

The Planned Interventions codes (I-codes), n=215

I-code	Frequency	Percentage
I1.2 Prescriber asked for information	113	53 %
I1.4 Intervention discussed with prescriber	81	38 %
I3.6 Drug started	47	22 %
I1.3 Intervention proposed to prescriber	29	13 %
I2.1 Patient (drug) counselling	26	12 %
I1.1 Prescriber informed only	10	5 %



**Case 13**

Mr. M has been prescribed amoxicillin 250 mg, two tablets three times a day, for two days for a recurrent chest infection. You phone the doctor because you find the duration of the course too short. He says it was just a slip of the pen. It should be for 7 days.

Number of DRPs recognised in this case, n=216

Number of DRPs	Frequency	Percentage
1	209	97 %
2	7	3 %

The Problems codes (P-codes), n=214

P-code	Frequency (potential/manifest)	Percentage
P1.2 Effect of drug treatment not optimal	169 (129/41)	79 %
P1.1 No effect of drug treatment	28 (23/5)	13 %
P3.3 Unclear problem/complaint. Further clarification necessary (please use as escape only)	9 (4/3)	4 %
P1.3 Untreated symptoms or indication	7 (5/3)	3 %
P2.1 Adverse drug event (possibly) occurring	4 (4/0)	2 %
P3.1 Problem with cost-effectiveness of the treatment	1 (1/0)	0 %

The Causes codes (C-codes), n=214

C-code	Frequency	Percentage
C4.1 Duration of treatment too short	207	97 %

The Planned Interventions codes (I-codes), n=213

I-code	Frequency	Percentage
I1.4 Intervention discussed with prescriber	94	44 %
I1.3 Intervention proposed to prescriber	76	36 %
I1.2 Prescriber asked for information	50	23 %
I3.4 Instructions for use changed	35	16 %
I3.2 Dosage changed	20	9 %
I1.1 Prescriber informed only	18	8 %

**Case 14**

Mrs. N arrives at your pharmacy to collect her monthly prescription for the stomach: omeprazole 20mg, once daily. During the conversation she mentions that she still has occasionally reflux problems during the night. You advise her to take the drug before the evening meal. A week later she arrives with a prescription for omeprazole 20mg twice a day. Your suggestion has not helped her.

Number of DRPs recognised in this case, n=215

Number of DRPs	Frequency	Percentage
1	199	93 %
2	15	7 %
3	1	1 %

The Problems codes (P-codes), n=215

P-code	Frequency (potential/manifest)	Percentage
P1.2 Effect of drug treatment not optimal	163 (15/149)	76 %
P1.1 No effect of drug treatment	40 (2/39)	19 %
P1.3 Untreated symptoms or indication	11 (4/7)	5 %
P2.1 Adverse drug event (possibly) occurring	10 (3/6)	5 %
P3.3 Unclear problem/complaint. Further clarification necessary (please use as escape only)	2 (1/1)	1 %
P3.1 Problem with cost-effectiveness of the treatment	1 (1/0)	0 %

The Causes codes (C-codes), n=215

C-code	Frequency	Percentage
C6.1 Inappropriate timing of administration and/or dosing intervals	66	31 %
C3.1 Drug dose too low	64	30 %
C3.3 Dosage regimen not frequent enough	43	20 %
C7.7 Inappropriate timing or dosing intervals	40	19 %
C3.5 Dose timing instructions wrong, unclear or missing	34	16 %

The Planned Interventions codes (I-codes), n=213

I-code	Frequency	Percentage
I2.1 Patient (drug) counselling	148	69 %
I3.4 Instructions for use changed	93	44 %
I3.2 Dosage changed	28	13 %

**Case 15**

Mr. O, is a 61-year-old obese man with a history of type 2 diabetes (NIDDM) for 10 years and ischaemic heart disease (angina). He also has a history of constipation relieved by lactulose taken as required. He has been on glipizide and metformin. When you evaluate the drug use you recognise a lack of adherence. He admits that he sometimes misses his medication because he simply forgets. You discuss the necessity of being compliant with the medication with him, and he will try to be more adherent in the future. You also suggest that if he is more adherent, he should have his blood sugar tested at some point in time.

Number of DRPs recognised in this case, n=215

Number of DRPs	Frequency	Percentage
1	189	88 %
2	23	11 %
3	3	1 %

The Problems codes (P-codes), n=215

P-code	Frequency (potential/manifest)	Percentage
P1.2 Effect of drug treatment not optimal	180 (90/88)	84 %
P2.1 Adverse drug event (possibly) occurring	15 (11/4)	7 %
P1.1 No effect of drug treatment	14 (8/7)	7 %
P3.3 Unclear problem/complaint. Further clarification necessary (please use as escape only)	13 (6/7)	6 %
P1.3 Untreated symptoms or indication	11 (6/6)	5 %
P3.1 Problem with cost-effectiveness of the treatment	1 (1/0)	0 %

The Causes codes (C-codes), n=215

C-code	Frequency	Percentage
C7.1 Patient uses/takes less drug than prescribed or does not take the drug at all	178	83 %
C6.2 Drug under-administered	20	9 %
C7.9 Patient unable to use drug/form as directed	18	8 %
C7.7 Inappropriate timing or dosing intervals	14	7 %
C9.1 No or inappropriate outcome monitoring (incl. TDM)	11	5 %

The Planned Interventions codes (I-codes), n=214

I-code	Frequency	Percentage
I2.1 Patient (drug) counselling	205	96 %
I4.1 Other intervention (specify)	26	12 %
I2.3 Patient referred to prescriber	12	6 %

**Case 16**

Mr. P is a 72 years old retired dentist. He has been receiving enalapril 20mg/hydrochlorothiazide 12.5 mg in the morning for about 3 years for his mild-moderate heart failure. This has also kept his blood pressure controlled fairly well at 150-160 / 85-90 mm Hg. He now presents a prescription for digoxin 0.125 mg daily and aspirin 75 mg daily that he tells you is for atrial fibrillation. You think that he should be on warfarin or a DOAC instead of aspirin for the AF, and contact the physician. The prescription is adapted.

Number of DRPs recognised in this case, n=216

Number of DRPs	Frequency	Percentage
1	195	90 %
2	20	9 %
3	1	1 %

The Problems codes (P-codes), n=216

P-code	Frequency (potential/manifest)	Percentage
P1.2 Effect of drug treatment not optimal	131 (102/32)	61 %
P1.3 Untreated symptoms or indication	33 (21/13)	15 %
P1.1 No effect of drug treatment	28 (27/2)	13 %
P2.1 Adverse drug event (possibly) occurring	19 (19/1)	9 %
P3.2 Unnecessary drug-treatment	8 (6/2)	4 %
P3.3 Unclear problem/complaint. Further clarification necessary (please use as escape only)	7 (3/3)	3 %
P3.1 Problem with cost-effectiveness of the treatment	1 (1/0)	0 %

The Causes codes (C-codes), n=216

C-code	Frequency	Percentage
C1.1 Inappropriate drug according to guidelines/formulary	165	76 %
C1.6 No or incomplete drug treatment in spite of existing indication	28	13 %
C1.4 Inappropriate combination of drugs or drugs and herbal medication or drugs and dietary supplements	22	10 %
C1.2 Inappropriate drug (within guidelines but otherwise contra-indicated)	16	7 %

The Planned Interventions codes (I-codes), n=215

I-code	Frequency	Percentage
I1.3 Intervention proposed to prescriber	129	60 %
I3.1 Drug changed	81	37 %
I1.4 Intervention discussed with prescriber	73	34 %
I2.1 Patient (drug) counselling	24	11 %

**Case 17**

Mr. Q, 70 years old, has been diagnosed with hypertension 4 months ago (at time of the diagnosis the BP was 180/95). The GP has asked him to check his blood pressure regularly every 2 weeks for the time being. He is being treated with hydrochlorothiazide and an ACE-inhibitor. He comes in with a list of measurements. At the last 3 measurements his blood pressure was 165/95 and you start worrying. You find out that he has stopped to take his diuretic because he did not want to be bothered by going to the toilet multiple times in the morning when he visits his grandchildren (almost daily). You tell him that he must take his medication properly and that will most probably also bring his blood pressure in a normal range again. He is not willing to do that, and will go to his GP to discuss the issue.

Number of DRPs recognised in this case, n=216

Number of DRPs	Frequency	Percentage
1	195	90 %
2	20	9 %
3	1	1 %

The Problems codes (P-codes), n=215

P-code	Frequency (potential/manifest)	Percentage
P1.2 Effect of drug treatment not optimal	159 (13/148)	74 %
P1.1 No effect of drug treatment	27 (2/25)	13 %
P2.1 Adverse drug event (possibly) occurring	23 (3/22)	11 %
P1.3 Untreated symptoms or indication	19 (1/17)	9 %
P3.1 Problem with cost-effectiveness of the treatment	3 (1/2)	1 %
P3.3 Unclear problem/complaint. Further clarification necessary (please use as escape only)	3 (0/3)	1 %
P3.2 Unnecessary drug-treatment	1 (0/0)	0 %

The Causes codes (C-codes), n=216

C-code	Frequency	Percentage
C7.1 Patient uses/takes less drug than prescribed or does not take the drug at all	182	84 %
C6.4 Drug not administered at all	20	9 %
C7.9 Patient unable to use drug/form as directed	12	6 %

The Planned Interventions codes (I-codes), n=215

I-code	Frequency	Percentage
I2.1 Patient (drug) counselling	192	89 %
I2.3 Patient referred to prescriber	48	22 %

**Case 18**

Mrs. R has a history of angina and had a coronary artery bypass graft two weeks ago. She was discharged from the hospital last week and brings her prescription to you. Her GP has prescribed:

- Diltiazem 60 mg, 3 x 1
- Atenolol 50 mg, 1x1
- Isosorbide Mononitrate 40 mg, 3x1
- Simvastatin 20 mg, 1x1
- Acetylsalicylic acid 80 mg, 1 x 1

It looks like the isosorbide is no longer necessary. You phone the GP and agree not to dispense the isosorbide. He is going to see the patient soon and will check the blood pressure and discuss the rest of the treatment.

Number of DRPs recognised in this case, n=216

Number of DRPs	Frequency	Percentage
1	208	96 %
2	7	3 %
3	1	1 %

The Problems codes (P-codes), n=216

P-code	Frequency (potential/manifest)	Percentage
P3.2 Unnecessary drug-treatment	160 (100/57)	74 %
P2.1 Adverse drug event (possibly) occurring	34 (36/2)	16 %
P1.2 Effect of drug treatment not optimal	18 (13/4)	8 %
P1.3 Untreated symptoms or indication	7 (6/0)	3 %
P1.1 No effect of drug treatment	4 (2/2)	2 %
P3.3 Unclear problem/complaint. Further clarification necessary (please use as escape only)	4 (3/1)	2 %

The Causes codes (C-codes), n=215

C-code	Frequency	Percentage
C1.3 No indication for drug	100	47 %
C1.7 Too many drugs prescribed for indication	46	21 %
C4.2 Duration of treatment too long	26	12 %
C1.1 Inappropriate drug according to guidelines/formulary	25	11 %
C8.1 No medication reconciliation at patient transfer	24	11 %
C8.2 No updated medication list available	14	7 %
C1.5 Inappropriate duplication of therapeutic group or active ingredient	13	6 %

The Planned Interventions codes (I-codes), n=215

I-code	Frequency	Percentage
I1.4 Intervention discussed with prescriber	120	56 %
I1.3 Intervention proposed to prescriber	98	46 %
I3.5 Drug paused or stopped	84	39 %
I1.1 Prescriber informed only	11	5 %

**Case 19**

Mrs. S is 49 years old, and gradually has more difficulties swallowing her levodopa/benserazide (Madopar® 62.5) capsules that she gets because of Parkinson's disease. After discussing this with her, you call the doctor to ask if she should not rather have the Madopar® 125 disper tablets that she can break and disperse in water, and the doctor agrees.

Number of DRPs recognised in this case, n=216

Number of DRPs	Frequency	Percentage
1	208	96 %
2	7	3 %
3	1	1 %

The Problems codes (P-codes), n=213

P-code	Frequency (potential/manifest)	Percentage
P1.2 Effect of drug treatment not optimal	122 (52/70)	57 %
P3.3 Unclear problem/complaint. Further clarification necessary (please use as escape only)	42 (8/32)	20 %
P2.1 Adverse drug event (possibly) occurring	32 (16/16)	15 %
P1.1 No effect of drug treatment	14 (10/6)	7 %
P1.3 Untreated symptoms or indication	6 (4/2)	3 %
P3.1 Problem with cost-effectiveness of the treatment	6 (2/4)	3 %

The Causes codes (C-codes), n=216

C-code	Frequency	Percentage
C2.1 Inappropriate drug form (for this patient)	192	89 %
C7.9 Patient unable to use drug/form as directed	72	33 %

The Planned Interventions codes (I-codes), n=215

I-code	Frequency	Percentage
I1.3 Intervention proposed to prescriber	128	60 %
I3.3 Formulation changed	91	42 %
I1.4 Intervention discussed with prescriber	89	41 %
I2.1 Patient (drug) counselling	47	22 %

**Case 20**

Mr. T is a 57-year old patient, who has been hospitalized for an acute myocardial infarction (AMI). He enters the pharmacy with some prescriptions, as well as an overview of the medication he should be taking from now on. While checking the different documents, you discover that the prescription (given by the hospital nurse) mentions omeprazole 20 mg, 1x/day, while the medication overview mentions omeprazole 40 mg, 1x/day. You are unsure what to do and decide to call the physician in the hospital, who confirms you the correct dose is 40 mg.

Number of DRPs recognised in this case, n=216

Number of DRPs	Frequency	Percentage
1	210	97 %
2	6	3 %

The Problems codes (P-codes), n=215

P-code	Frequency (potential/manifest)	Percentage
P1.2 Effect of drug treatment not optimal	138 (112/24)	64 %
P3.3 Unclear problem/complaint. Further clarification necessary (please use as escape only)	47 (23/23)	22 %
P2.1 Adverse drug event (possibly) occurring	22 (19/2)	10 %
P3.1 Problem with cost-effectiveness of the treatment	7 (6/1)	3 %
P1.1 No effect of drug treatment	6 (7/1)	3 %
P3.2 Unnecessary drug-treatment	2 (1/1)	1 %

The Causes codes (C-codes), n=216

C-code	Frequency	Percentage
C3.1 Drug dose too low	87	40 %
C8.3 Discharge/transfer information about medication incomplete or missing	74	34 %
C8.1 No medication reconciliation at patient transfer	53	24 %
C3.5 Dose timing instructions wrong, unclear or missing	13	6 %
C8.2 No updated medication list available	13	6 %
C6.2 Drug under-administered	10	5 %

The Planned Interventions codes (I-codes), n=215

I-code	Frequency	Percentage
I1.2 Prescriber asked for information	109	51 %
I1.4 Intervention discussed with prescriber	83	39 %
I3.2 Dosage changed	44	20 %
I1.3 Intervention proposed to prescriber	19	9 %
I2.1 Patient (drug) counselling	10	5 %



## Evaluation questionnaire

### Sociodemographic data

#### Response

Data collection took place from 6. 11. 2019 to 29. 2. 2020. There were 169 completed evaluation questionnaires.

Response rate (?)		Base: Entered intro ▼
Status	Frequency	State
Entered intro	307	100%
Entered first page	211	69%
Started responding	188	61%
Partially completed	188	61%
Completed	169	55%
<b>Unit usability (50%/80%)</b>		
Usable units	165	88%
Partially usable units	6	3%
Unusable units	17	9%
<b>Breakoffs</b>		
Introductory breakoffs	119	39%
Questionnaire breakoffs	19	6% (neto 10%)
Total breakoffs	138	45%

#### Terms explanation

**Entered intro:** each click to the survey is counted, irrespective of whether the survey was completed in full or if the respondent left the survey immediately after clicking on the URL.

**Entered first page:** each respondent that clicked on 'Next page' is counted.

**Partially completed:** each respondent that answered at least one question is counted.

**Completed the survey:** each respondent that answered clicked on the 'End' button on the last page of the survey is counted.

Unit usability:

**Usable units:** questionnaires where the respondent answered more than 80% of the responses

**Partially usable units:** questionnaires with 50%-80% of usable responses.

**Unusable units:** questionnaires with less than 50% of usable responses (but at least 1 question answered)

Usable units + partially usable units + unusable units = partially completed questionnaires = valid questionnaires.

Breakoffs:

The respondent stopped answering the questions and left the survey at a certain point.

**Introductory breakoffs:** breakoff after reading introduction

**Questionnaire breakoffs:** breakoffs during filling the questionnaire

**Total breakoffs:** sum of the above

**Country of practice/work (n=188)**

Country	Frequency	Percentage
Norway	41	22 %
Turkey	26	14 %
China	25	13 %
Croatia	24	13 %
Portugal	23	12 %
Sweden	14	7 %
Slovenia	11	6 %
Poland	10	5 %
Serbia	4	2 %
Spain	4	2 %
Costa Rica	3	2 %
Mexico	2	1 %
Germany	1	1 %

**Principal professional setting (n=188)**

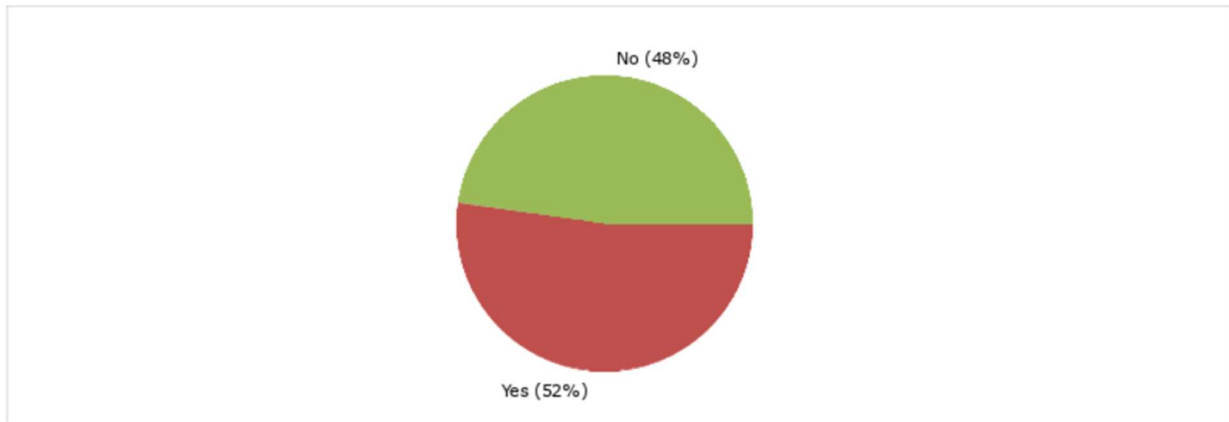
Country	Frequency	Percentage
Hospital pharmacy	75	40 %
Community pharmacy	54	29 %
Academic pharmacy	39	21 %
Medical hospital practice	7	4 %
Regulatory affairs	4	2 %
MSc student pharmacy	4	2 %
Consultant pharmacy	3	2 %
Administrative pharmacy	2	1 %

**Years of practice (n=183)**

Country	Frequency	Percentage
No practice experience	4	2 %
0-5 years	47	26 %
6-10 years	38	21 %
10-20 years	62	34 %
20-30 years	18	10 %
>30 years	14	8 %

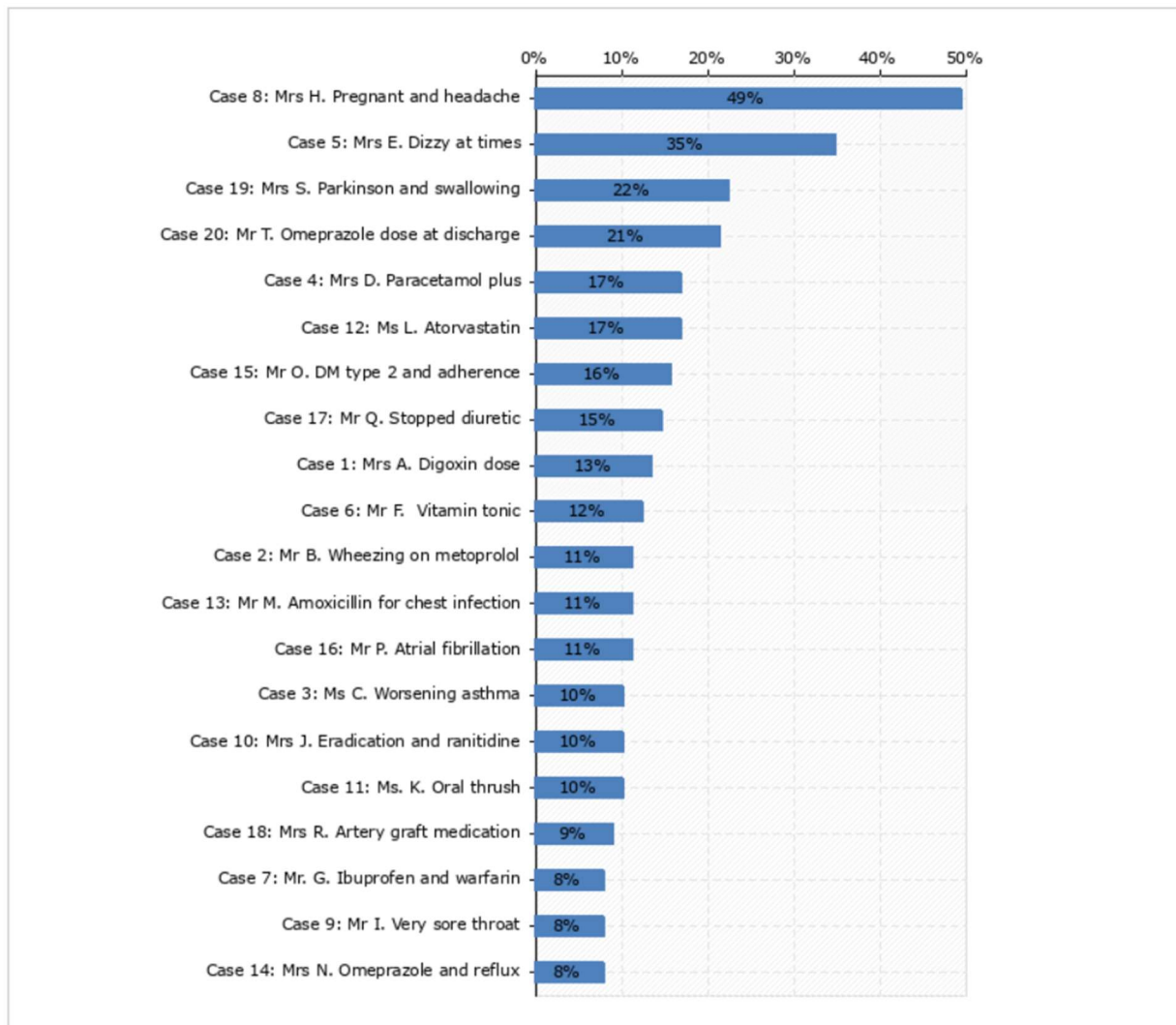
## Problems section

After you had completed the validation cases, did you have problems finding a proper code for any of the problems mentioned in the cases? (n = 176)

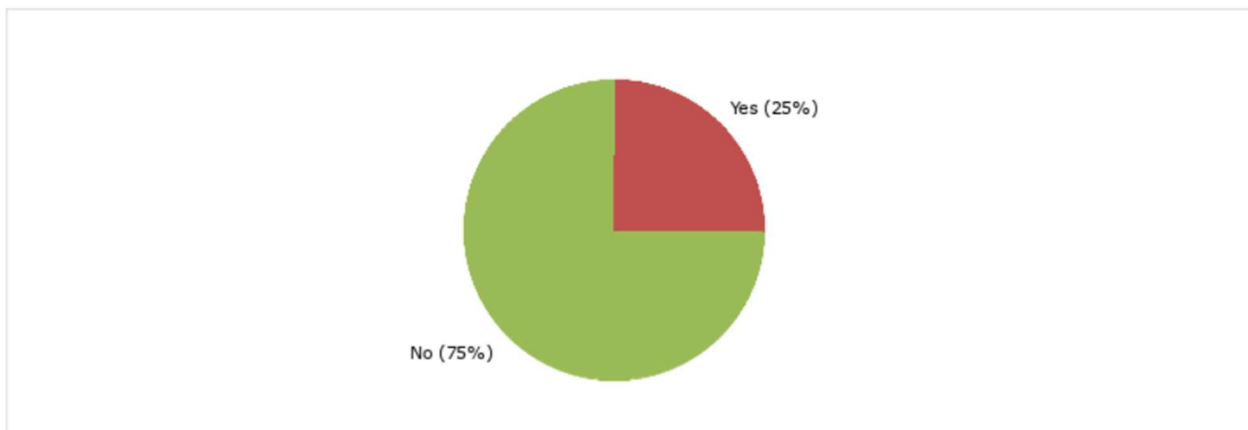


If yes, for which case(s)? (n = 89)

Multiple answers are possible



Thinking of the drug-related problems that you encounter in your work, do you find that any significant problem is missing in the problem list of the classification? (n = 176)



**If Yes, which problem? Please describe.**

adherence

code for problems due to health personal as wrong druglist by discharge

i think we need more options in order to choose the better.

drug-drug interactions

no.5, no8

treatment necessity

in above mentioned cases, i would mark insufficient adherence and drug interaction(s) in "problem" section because codes p1.2. and p2.2. do not fully describe this type of problems.

you can add to classification "effectiveness of treatment is unclear"

no.5, one of the adr of amitriptyline is dizzy

altered patient factors for example increasing age, kidney function etc

drug availability

insufficient dose

anxiety of drugs or adverse events. cost of drugs. non-active ingredients. generics incl switches

escape from non-drps

1. drug-drug interactions. 2. not directly drug related problem but also a problem with the patient's drug use. 3. adherence to medication. 4. patient's ability to use drugs 5. drug prescription errors.

missing/inaccurate prescription

for example, c7 has no compliance options; I2, no patient medication education option.

poor adherence

override dose

not adverse drug reactions but adverse events caused by improper drug use

compliance problem

not practical, for example 1x3 when 1x1 is possible.

problema relacionados con desabasto del medicamento indicado o fuera del cuadro basicoadro basico

practical issues with drug handling (working in paediatrics) - causing potential treatment failure

`drug-drug interactions` can added under the p2. treatment safety

not optimal treatment for indication

o que te ver com a falta de reconciliação terapêutica.

problem related to unintended errors during writing prescriptions or medication reconciliation

compliance, administration problems that make the patient unable to use drug, and difficult to categorize when the patient needed examination by a physician without any drug use.

lack of information regarding medication, or incorrect information

uso inadecuado del tratamiento

patient related use

non-optimal drug therapy which not necessarily is an ade or a treatment effectiveness problem, but the therapy obviously has a potential for improvement (e.g. case 19 - problem with swallowing)

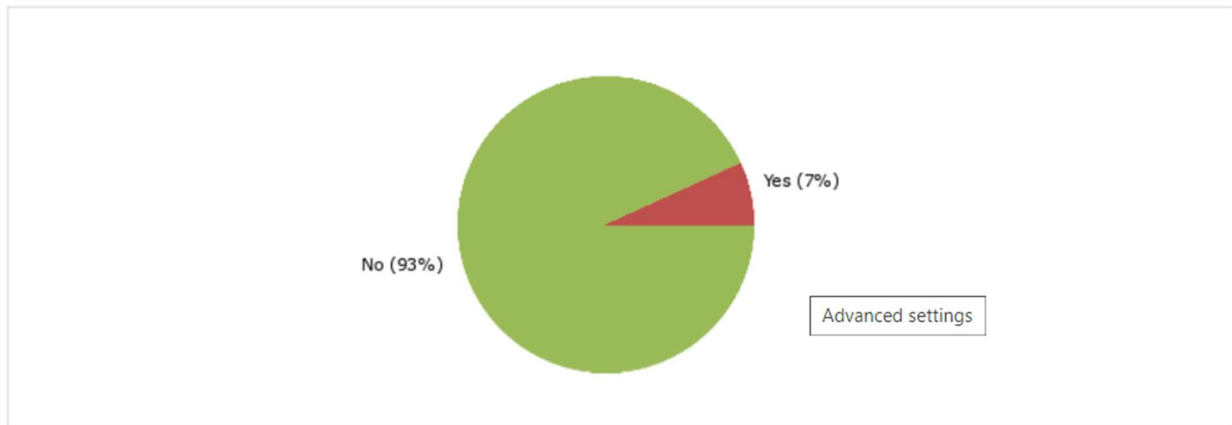
when the cause of the problem is related to adherence or wrong use i find it difficult to fit in in the existing problems

problems related to plants as products for health

problem with technical use of the drug (should be placed under other).

i think should be drug interaction section

Looking at the classification, do you find any of the mentioned problems redundant (superfluous or overlapping)? (n = 176)



**If Yes, which problem(s)? Please describe.**

pharmacogenomics. drug-gene interactions and individual metabolism.

patient number 8

the classification must be more specific and i think is very import to describe issues about natural plants

a1.3 does not make sense

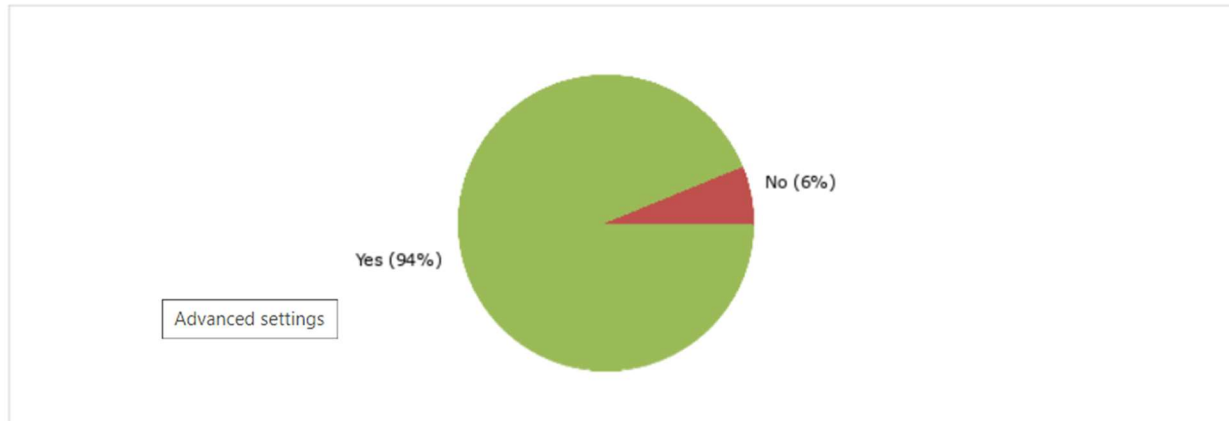
c7.8, c7.9

p1.1. and p1.2.

interventions: contacting the prescriber to discuss/suggest intervention mostly overlap. So I clicked on both mostly

inappropriate dose

Looking at the problem section of the the classification, are the titles of the domains clear? (n = 176)



**If No, which problem domain title is unclear? Please describe and give suggestion for improvement**

the classification must be more specific

there are other problems related to drugs that must be indicated in the classification

other - if other is defined as three problems in subdomains

something is missing. i am not able to point out exactly what, but repeatedly i missed a proper alternative

"other" consists of various problems without a connection between each other. suggestion for improvement is to introduce a new primary domain called "non-optimal prescribing" with the following 3 problems: cost-effectiveness, unnecessary drug treatment, other. may be need of a fourth primary domain called "other" as well.

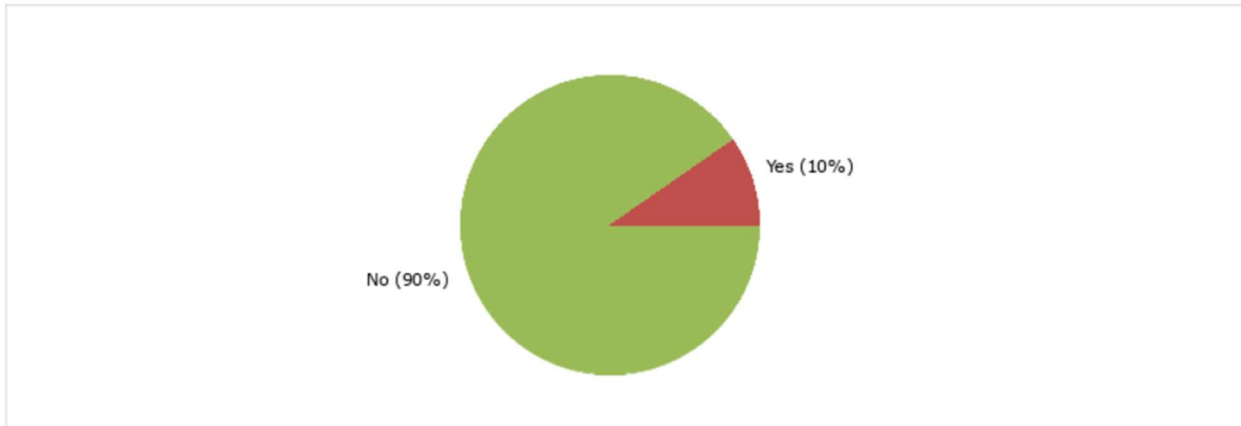
i think the problems section is too narrow with only treatment effectiveness and safety. I sometimes just had to choose the best option within treatment effectiveness.

p3.3

"treatment effectiveness" does not correlate well with "untreated symptom or indication"

type of problem

Looking at the classification, would you have placed any of the problems in another domain? (n = 176)



### If Yes, which problem and in what domain would you have placed it.

in the problem section is not very easy sometimes to see if the problem is only potential or if it is a manifest problem. example: in problem 19 - it's not very clear to understand if it's already a problem swallowing or if it's just a potential problem because at the time it seems that the patient still takes the pills although difficulties.

untreated symptoms in other or unnecessary drug-treatment in drug safety

compliance because of common side-effects (such as diuretics) - it is an adverse effect, but compliance is the result, and therefore raised blood pressure.

not adverse drug reactions but adverse events caused by improper drug use, p2.1

unnecessary drug treatment under p3 other could also be p2 possible adverse drug event. this is confusing

we need to add unable to use medication as problem

p3.2 could be placed in effectiveness problem (unnecessary drug- no effect)

reconciliação terapêutica

the causes can also be problems in my opinion, e.g. the once concerning lack of information c5.2, c7.10, 8. they could be in p instead of c

i do not remember, but some of them could be placed several places. e.g. too high dosage, lack of monitoring (tdc) for the digoxin

for example pregnant and headache

i would changed p3.2. (unnecessary drug-treatment) into p2.2 section -treatment safety

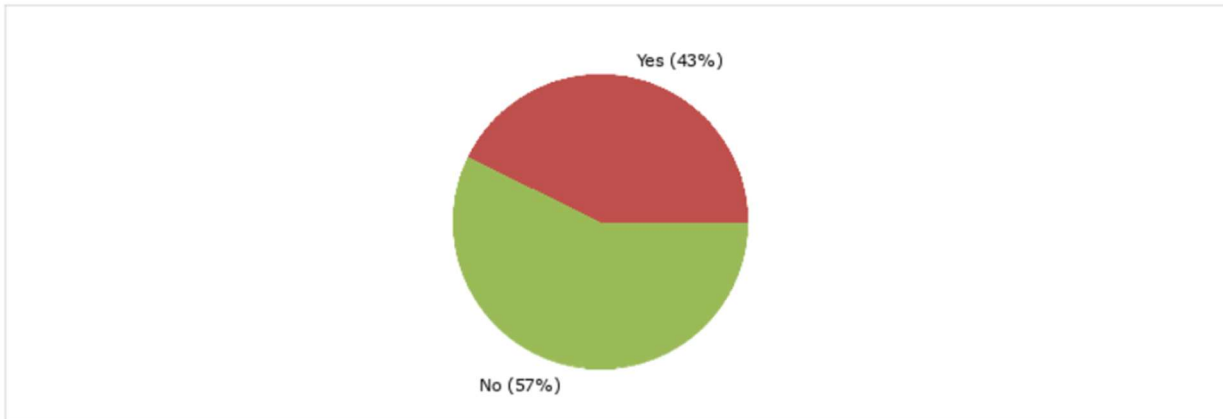
p3.2 can be placed in domain 1

unnecessary drug-treatment should be placed under treatment effectiveness.

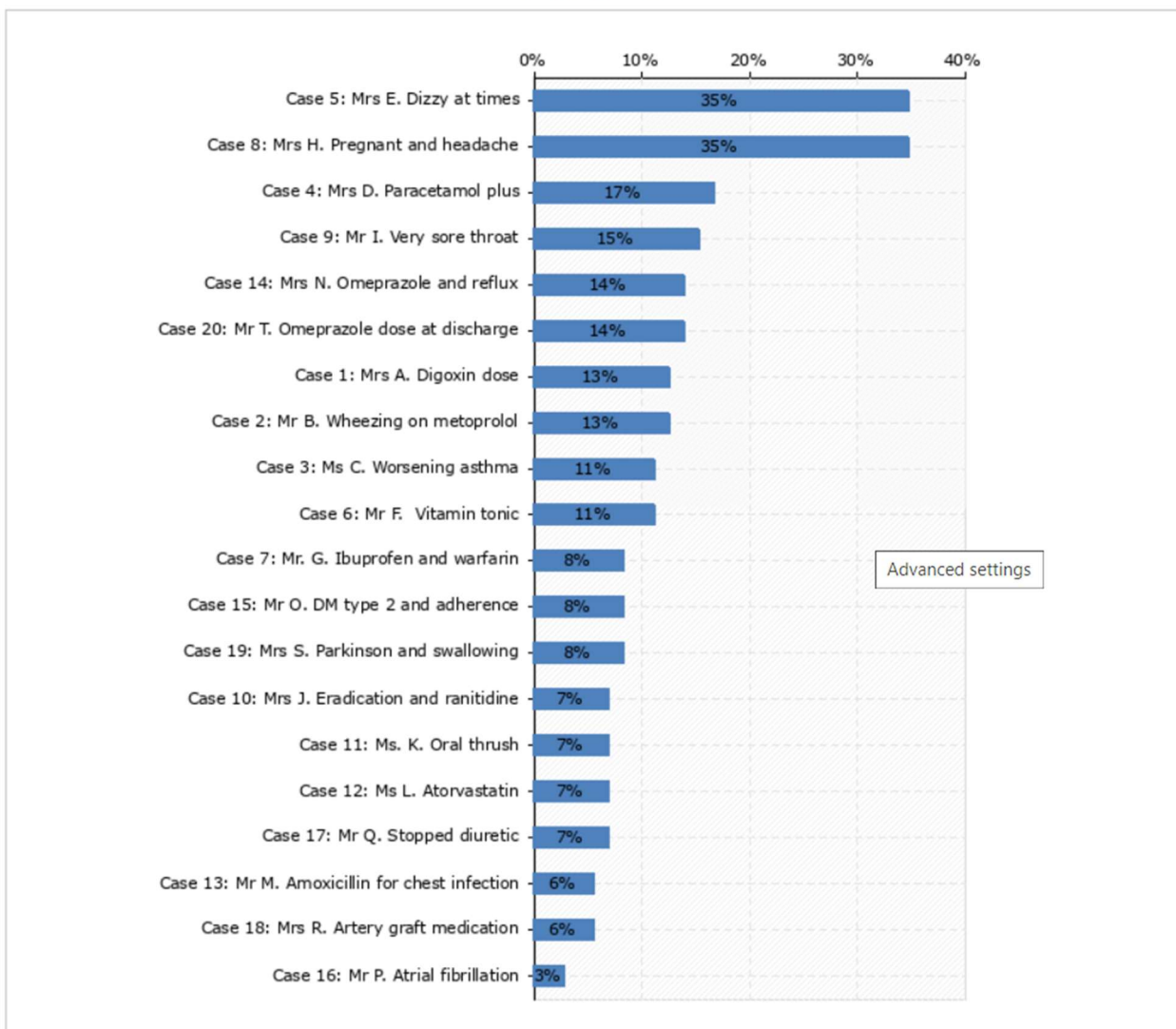


## Causes section

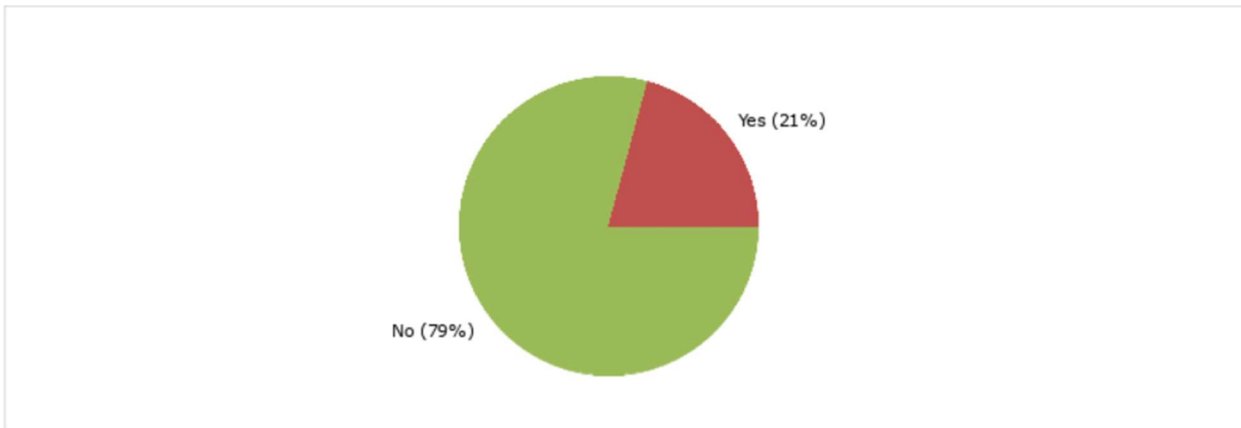
After you had completed the validation cases, did you have problems finding a proper code for any of the Causes mentioned in the cases? (n = 173)



If yes, for which case(s)? (n = 72)  
Multiple answers are possible



Thinking of the causes for drug-related problems that you encounter in your work, do you find that any significant cause is missing in the causes list of the classification? (n = 173)



**If Yes, which cause(s)? Please describe.**

doctor related

possible drug - gene interaction in amitryptiline case.

problems according to patients beliefs or misunderstanding and problems related to inappropriate dose or choice of drug due to age.

alergia a la droga seleccionada o prescrita

not optimal choice of drug, although not contraindication

patient`s belief

in code c8.3. i would add "...information about medication incomplete, missing or differ".

medication error

adverse drug reaction

for natural plants in combinations with drugs me

wrong prescription

no 5. i think the cause is patient related but need to select other to fill no obvious cause

interações

patient need to see a doctor

adverse events due to normal dose.

inadequate application

problems caused by patients beliefs/misbeliefs about treatment safety or effect

in drug use process (coded with c6) i think that is important to have another point or clarify the existents, related to the wrong use of the drug. not only because of wrong route of administration (classification that already exists) but because, in some cases, there is a problem of bad use of the drug itself. example: an inhaler that is not being correctly used - can be because of the patient but can also be because is not the most correct inhaler for the patient - and if i give them the advice to use a spacer i`m changing the instructions related

to the drug use or is considered patient counselling? because we are acting in the drug form but also in patient behaviour (code 7). i hope you understand my suggestion.

patient related adherence

adverse events, using normal dose.

when we talk about the "patient related" cause of the drp in my opinion is important also the age of the patient.

causes related with natural plants in combinations with drugs

case1 missing adverse drug reaction

cause of drp when patient is taking the drug as prescribed, prescription is within guidelines and not contra-indicated, but the patient still experiences side-effects. is it supposed to be "no obvious cause"? there is a cause to the side-effect, the drug itself. drug inappropriate for this specific patient. could also be due to allergy

presentation of new indications

It may be clarified whether he / she can't do it because of a physical / mental disability or lack of information for `patient unable to use drug/form as directed` domain. A domain may be added that `patient do not use drug as directed (because of lack of information or although he knows how to use it)`. I mean with meals, with a lot of water etc.

using a medicine without indication

insufficient dose; using the form of drugs inappropriately; "patient unable to use drug/form as directed" is not understandable, it should be stated more clearly.

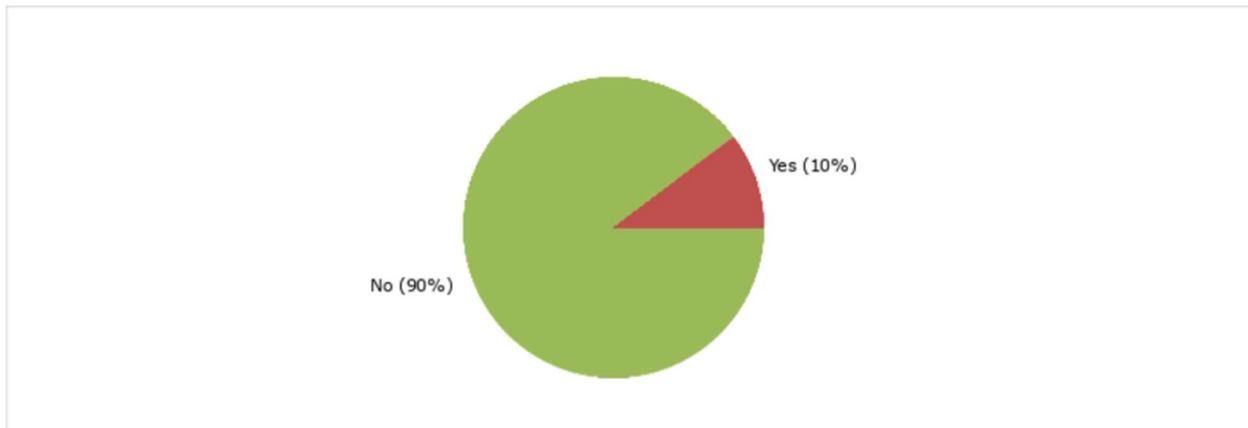
Inappropriate drug because of occurring side effects with proper use/right dosage. The drug might not be contraindicated (see case 2).

altered patient factors as previously mentioned

for the intervention classification you can add "treatment duration changed to ...."

1. drug-drug interaction. 2. misunderstanding of drug administrations by patients.

Looking at the classification, do you find any of the mentioned causes redundant (superfluous or overlapping)? (n = 173)



**If Yes, which cause(s)? Please describe.**

difficult to choose c7.1 or c7.9 if the patient forgets to take his/her medications. if you can't remember are you then unable to take the drug as directed?

many subdomains are overlapping by enlighting the same "cause" from a different perspectives, e.g. inappropriate drug formulation c2.1 and c7.9, c5.2 and many subdomains in the domain 8.

one or two in c3 and c6 regarding dosage regimens

pregnant and headache for example

c6 and c7 overlapps

c6 + c7

c8: c8.1 and c8.3 can be overlapping. when there is different information on medication list and prescriptions are different is that lack of reconciliation at discharge and missing information in discharge papers

c3.5

it is difficult to distinguish between each c8 code. and for example in case 14 it is difficult to decide if it is a c6.6. and c3.5.

c8.3 and c8.5 may be close together. the 8.3 is probably about info, while 8.5 is about medications.

c1.3 and c7.4 - if you chose one of them, wouldn't you also have to choose the other?

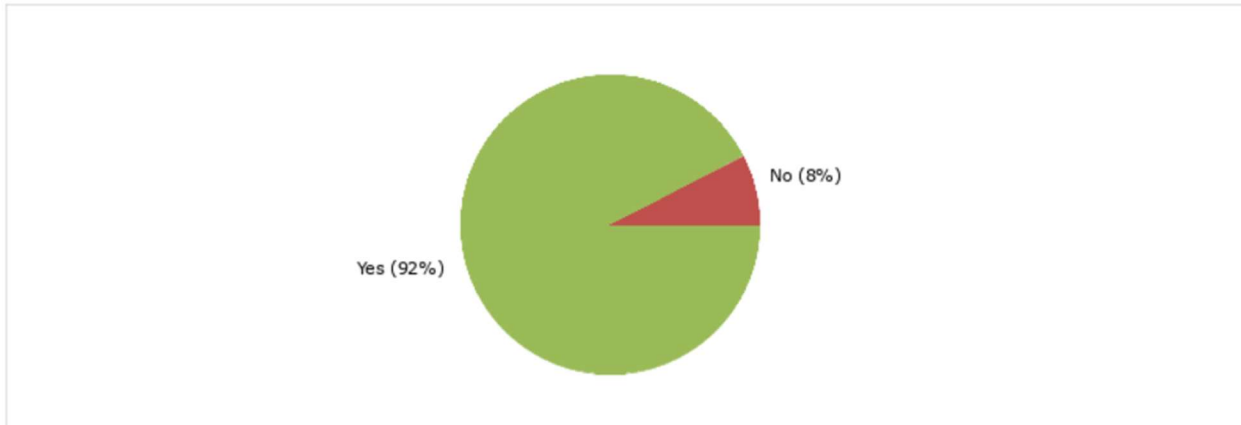
c6 and c7 are confusing even if i understand why you separate them

must be more specific and more detailed

c 1.5 & c 1.7

c1.5 (is covered by c1.4), and c1.7 (is covered by c1.3).

Looking at the causes section of the the classification, are the titles of the domains clear? (n = 173)



**If No, which Causes domain title is unclear? Please describe and give suggestion for improvement.**

\*forma de la droga, ya que no es clara a que se refiere;tendria que ser presentacion de la droga o medicamento (presentacion o forma farmaceutica)

drug use process it is not clear by the name that it is about drug that is given to the patient by someone else.

when i choose cause for patient related adherence, i fell confused in the option of c 7.8, c 7.9 and c 7.10.

i think must be more specific

drug use process- not clear if it is only health-professional related

no obvious cause could be clarified with examples

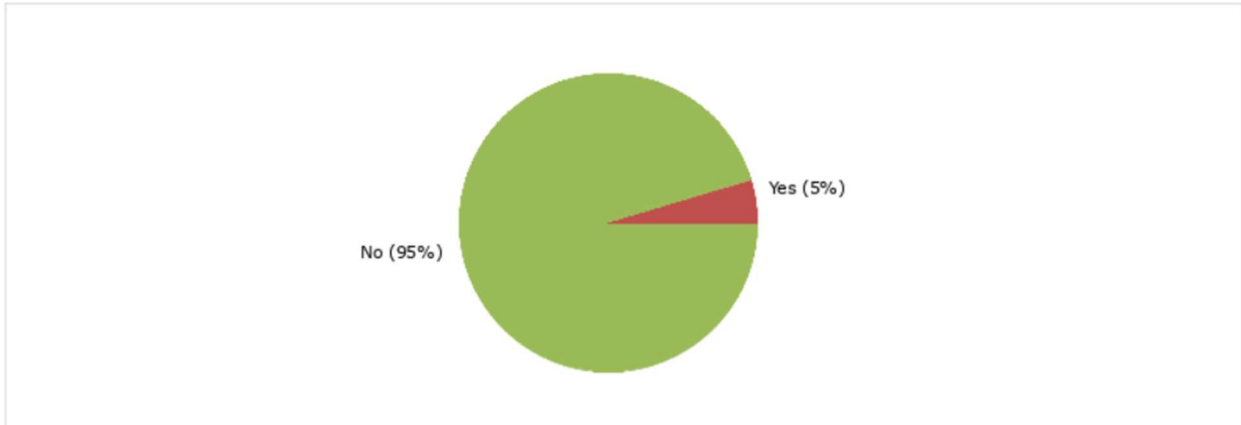
c6 c7

c6 is titled in two different ways: drug use process and drug administration process (the last in the non-computer form we could use before registration of data on the website form).

c8; unclear where to put discrepancies between different medication lists/prescriptions. suggested addition to c 8.3; "information incomplete, unclear or missing".

dispensing and drug use process are to me unclear. I guess it means, and should be changed to dispensing in the pharmacy and drug administration by other than the patient?

Looking at the classification, would you have placed any of the causes in another domain? (n = 173)



**If Yes, which Cause and in what domain would you have placed it in?**

I do not have any specific case but I think the causes and the classification must be more specific and have more detailed.

c8-4 (insuf clinical info) on c1 drug selection

I had some problems with the adherence cause

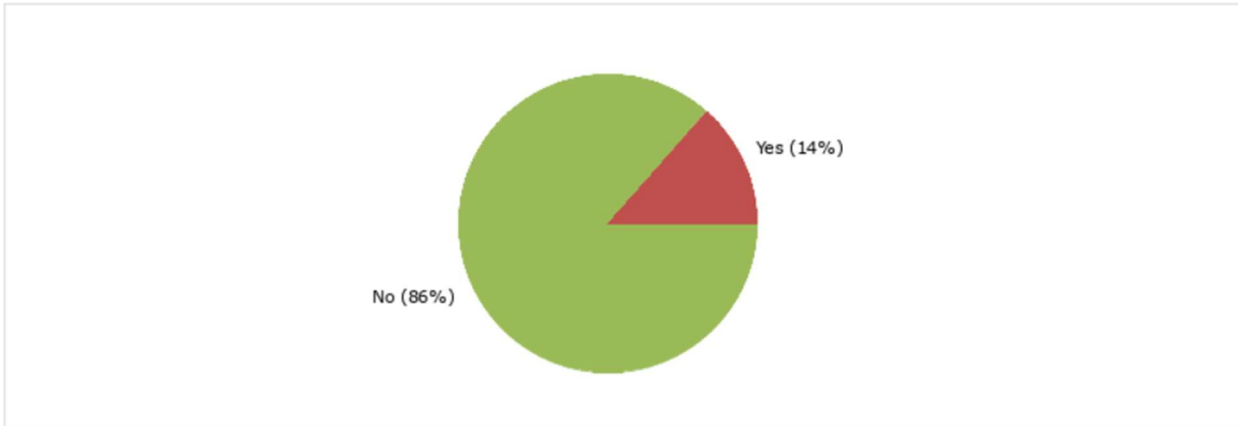
case2 c1 c1.2 c3 c3.1

see answer about c6 and c7

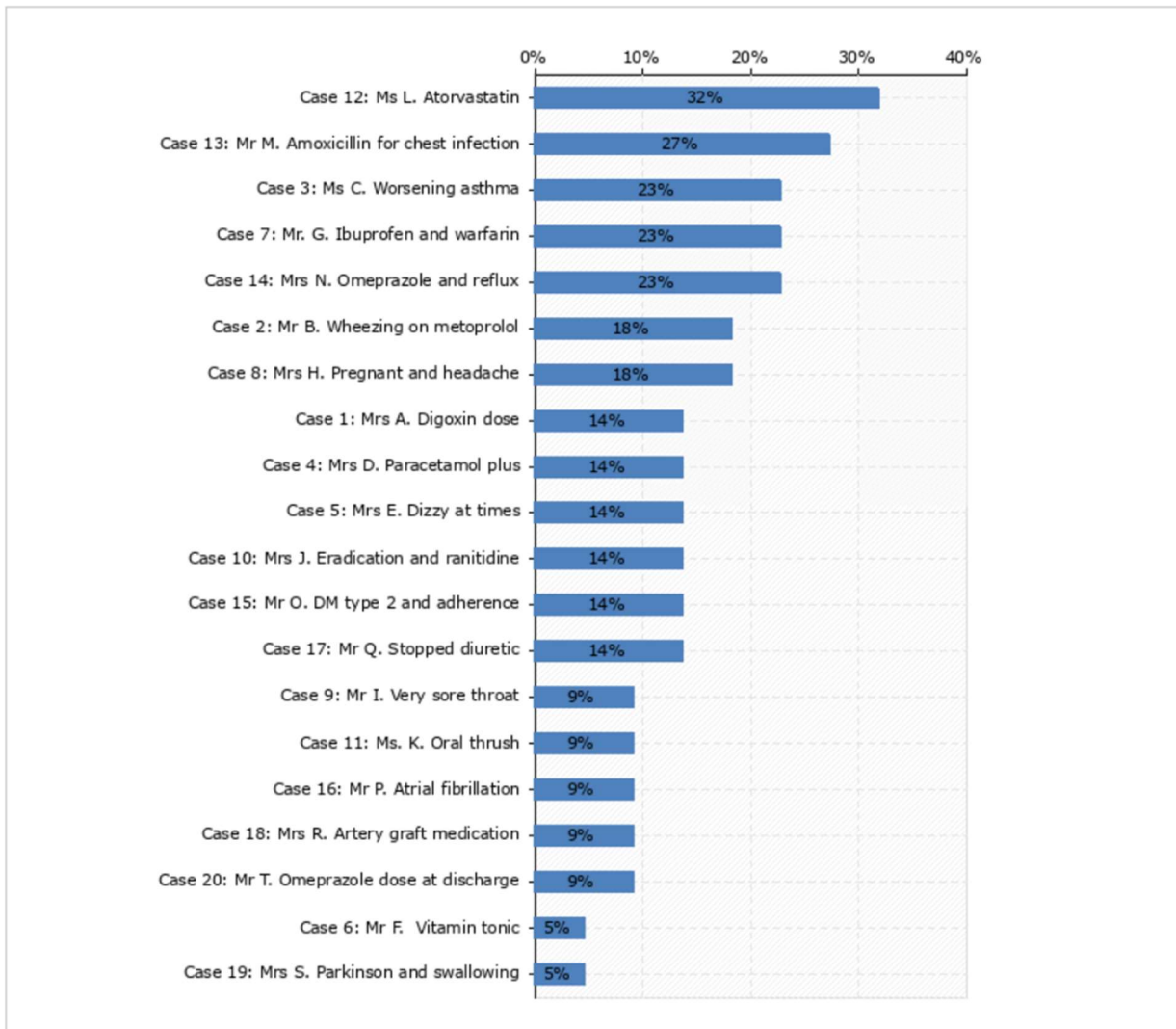
presentation of new indication/symptom

## Planned Interventions section

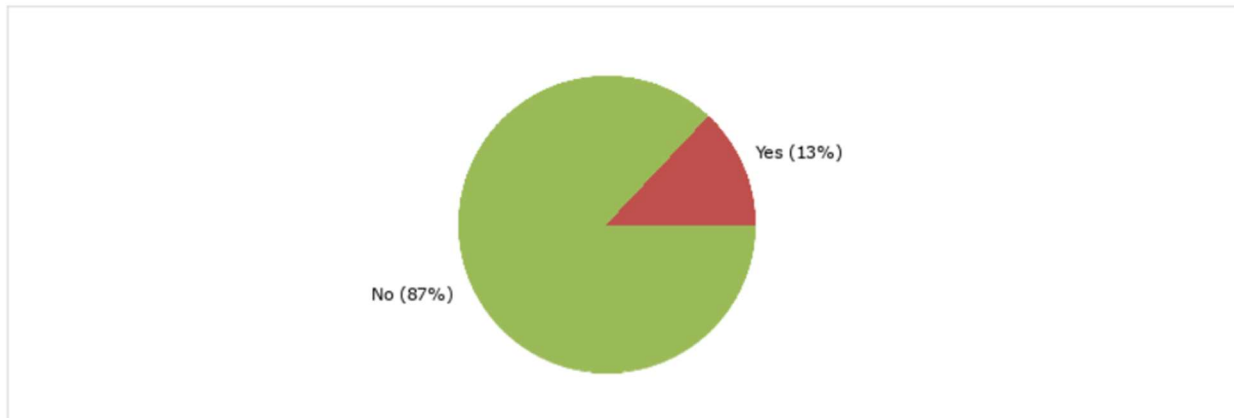
After you had completed the validation cases, did you have problems finding a proper code for any of the Planned Interventions mentioned in the cases? (n = 170)



If yes, for which case(s)? (n = 22)  
Multiple answers are possible



Thinking of the interventions for drug-related problems that you encounter in your work, do you find that any significant Intervention is missing in the Planned Intervention list of the classification? (n = 170)



### If Yes, which Intervention(s)? Please describe.

in section i3 i would add - drug continued; in section i2 add "self monitoring advised"

at drug level: 1. prolong the drug treatment; 2. use drug as directed; other intervention: appropriate monitoring

drug duration changed to

advice patient

between some plants and drugs

lack of intervention proposed to patient in i2 and lack of treatment course changed of...in i3  
i2, for example, lacks medication education for patients.

药师干预 · 给出血糖监测建议但无选项 (Google translate: Intervention by pharmacist, giving recommendations for blood glucose monitoring but no options)

lack of medication education for patients by pharmacists

1.drug duration, e.g. case 13; 2.dosage time, e.g.case 14

inappropriate excipients

contact with pharmacist in hospital. contact with nurse, dietist

i2.1 drug counselling. at a hospital setting it would be perhaps be interesting to differentiate between types of counselling, i.e. information, counselling, conversation, conversation on admission, reconciliation? monitoring is lacking in the interventions 3 (at drug level).

the pharmacist confirms with the prescriber

no.15.药师干预 · 提示患者血糖监测 (Google translate: Pharmacist intervention prompts patients for glucose monitoring)

verbal information; patient education

presentation in a multidisciplinary team

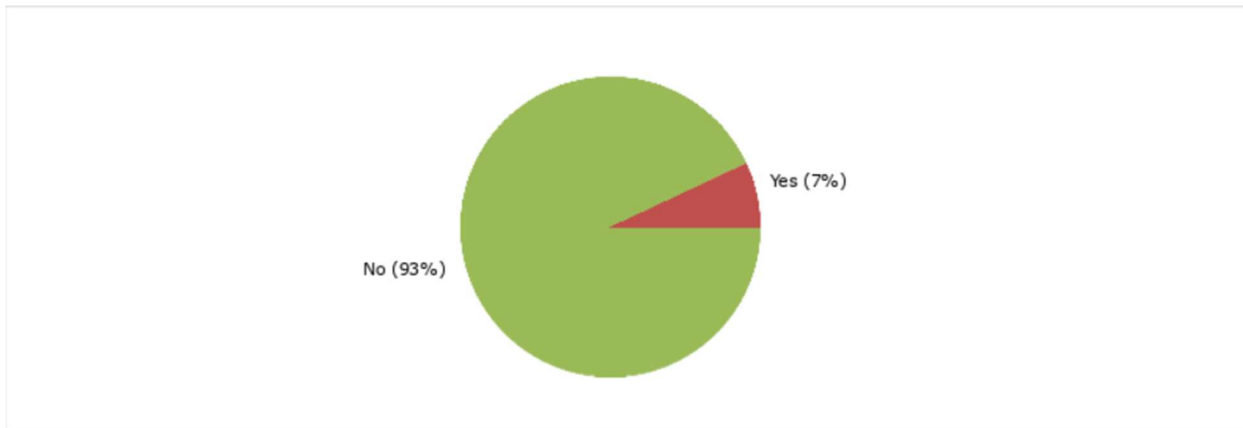
In some cases, there is patient counselling, but I was not sure that they are patient `(drug)` counselling or not, for example the selected cases above.



patient counselling, but patient not interested in counselling

`drug continued` domain may be added (case 12) , `drug stopped` domain may be updated as  
`drug tapering/stopped` (case 10)

Looking at the classification, do you find any of the mentioned Planned Interventions redundant (superfluous or overlapping)? (n = 170)



**If Yes, which Planned Intervention is redundant? Please describe and give suggestion for improvement.**

the difference between i1.3 and i1.4 is sometimes overlapping, because sometimes you discuss and propose something or propose something and there is a discussion

I1.3 and 1.4 - some difficulties to choose between those two

I1.3 & I1.4; I only understand both options if i1.3 is written communication and i1.4 oral communication

communication with prescriber often contains more than one of the factors

I1.3 and I1.4 - I think that at prescriber level, interventions are always discussed with prescriber...unless i1.3 refers only to written communication and i1.4 to oral communication

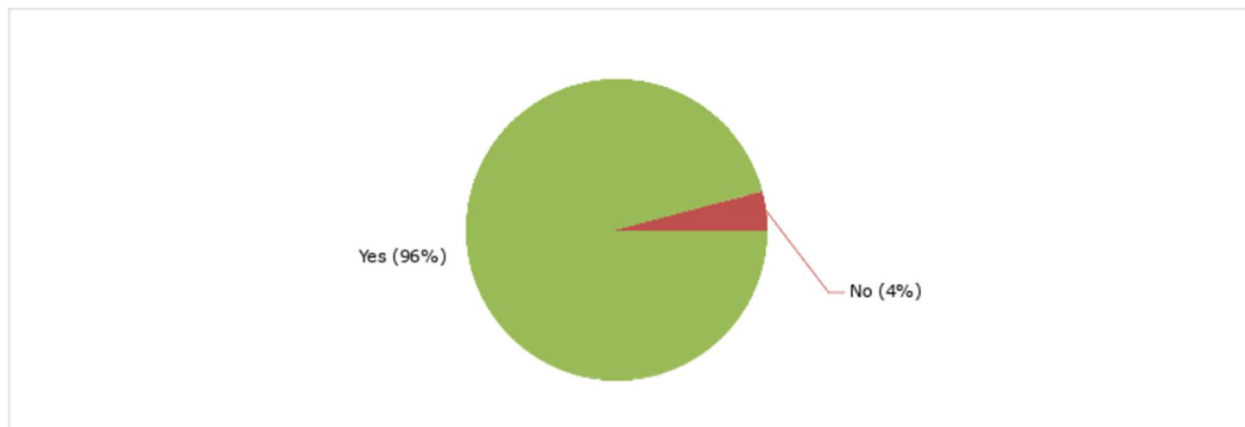
I1.3 - intervention proposed to prescriber vs I1.4 discussed with prescriber - may be enough with one of them, preferably the last I think.

a bit difficult sometimes to decide between I1.3 and I1.4.

Is not really being redundant but the question is that, for example, in cases 1, 2 and 4 we are acting at drug level (changing or pausing the drug), but we are also acting at prescriber level when talking with the gp or counselling patient to go to the gp.

I1.3 and I1.4 should be combined (proposed/discussed). I3.2 may be changed to dosage or treatment duration changed.

Looking at the Planned Intervention section of the the classification, are the titles of the domains clear? (n = 170)



**If No, which Planned Intervention domain title is unclear? Please describe and give suggestion for improvement.**

I feel this part is not clear. contacting physician leads to change of drug. what should i choose. physician first or drug?

a nivel del precriptor, no es claro a que se refiere exactamente con esta opcion al igual que con el subdomino de precriptor informado unicamente

it is not clear whether "prescriber asked for information" means that the prescriber asked for information or if the pharmacist contacted prescriber for information. the last one is much more common.

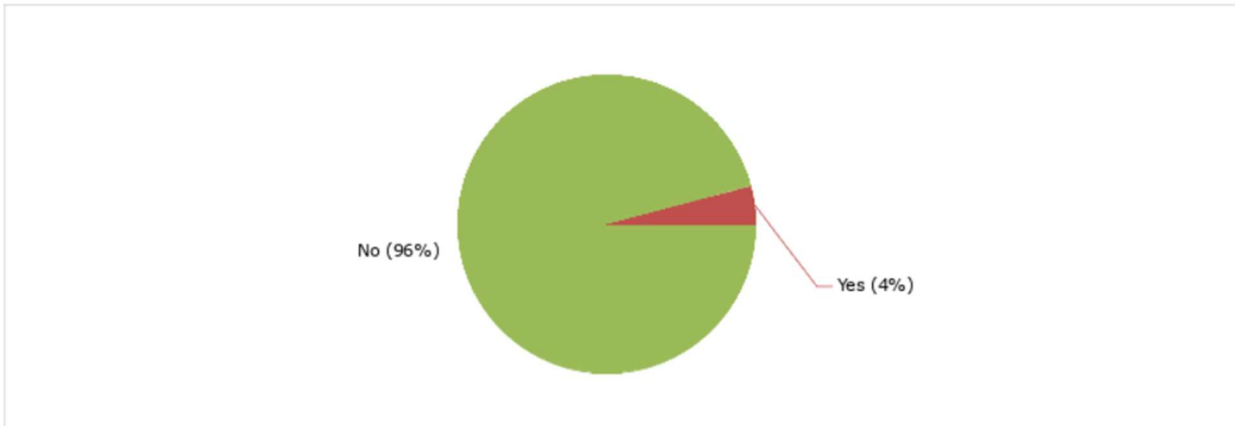
I 3.6 drug started, I cannot understand that the drug refers to new drugs or missed drugs from original prescription, e.g. case 12.

i1.1|i1.4

the classification must be specific and detailed

it is difficult to decide I1.3 and I1.4, difference between proposal and discussion

Looking at the classification, would you have placed any of the Planned Interventions in another domain? (n = 170)



**If Yes, which Planned Intervention and in what domain would you have placed it in?**

place i2.1 in i3.2 or i3.3

I often had to choose both patient related and drug related, maybe this is the purpose?

case 6 i2 i2.1 i3 i3.1

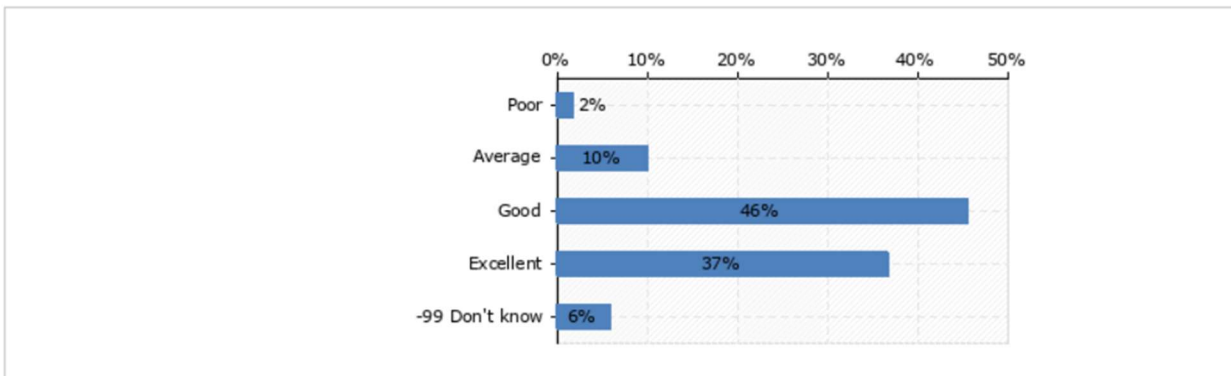
reporting adrs would better suit in primary domain. when placed in "other", it is not visible and seems non-significant

see above

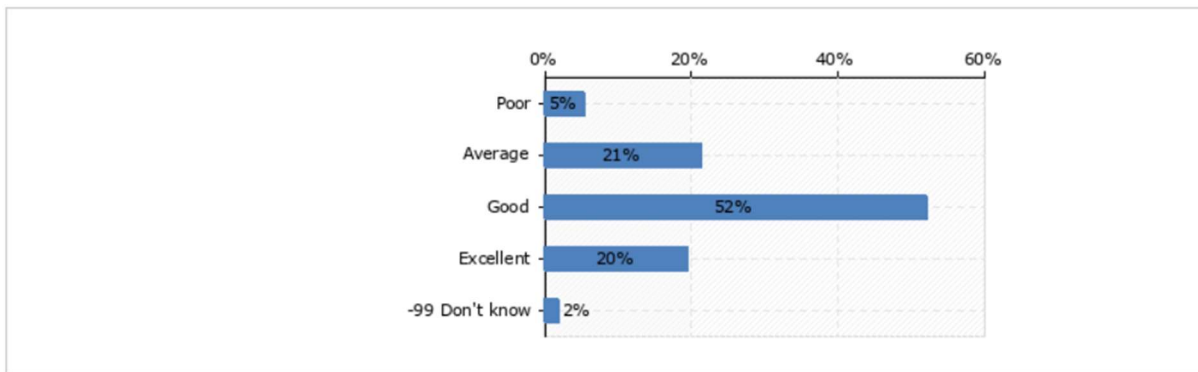
suggested addition: i3.7: "duration of treatment changed to ..."

## General

How did you rate the usability of the classification for research? (n = 169)



How did you rate the usability of the classification for daily professional practice? (n = 169)



## Additional comments

I really would like improve the understanding of this classification of the causes and problems related to drugs because at least in the field it is very important.

sometimes i confused between intervention proposed to prescriber and intervention discussed with prescriber. i suggest to supply the user by examples to each of the domains by this way at lease the user can follow these examples

at my hospital pharmacy we use the imm-model and are quite familial with this. it will take some time to get used with this new pcne drp-classification. furthermore, it seems quite time consuming to fill out the form. but i think it is naturally that all new tasks will create some reluctance to begin with.

for daily professional use, the sub-classifications are very extensive, however for research purposes they are very good

I hope that you find my suggestions useful and i wish you great success in the developing of this tool. any collaboration that you need feel free to ask.

I think they would be too time consuming in daily practice at the pharmacy, unless baseline data is retrieved automatically. Every time the gender of the prescriber is revealed in the cases it is "he". Not relevant to the classification, but I still find this a bit odd. Refer to the physician as "she" sometimes to make it more realistic and modern.

The case studies can be resolved in different ways depending to the guidelines of your country.

The practice of the pcne-drps classification system with regard to "treatment cost-effectiveness issues" is not very convenient, because many drug-related problems can ultimately be attributed to reduced (or increased) treatment costs. Therefore, specific details or rules should be made on how to classify treatment costs.

add new answer of cause

the cases were more related to the work in a pharmacy, and to the work at a hospital ward patient transfer related problems are very common, and should be addressed in a code of its own.

could have been more cases from hospitals, i.e. more from drug reviews. the cases shown were good re prescriptions

it takes too much time for completing it in a daily practise, especially if a printed version is used instead of an electronic one where transparency is better.

i like the tool because it can be used very fast in every day practice, but it needs some improvements like i named in the q to be even easier for use than it is now.

For me it was hard to put a number in the problems column and decide how much should be read into each case from the info provided. Maybe it wasn't clear enough for me how to separate problems or how much could be read into a single one. Possibly, a part of my struggle was linked to limitations in time I couldn't provide to "get to grips" with the classification system. Also, sometimes I read some information of impact that the pharmacist didn't clearly act upon which made it more difficult to approach the case. For example, if the pharmacist talked to the customer and thereafter phoned the prescriber with the result of changing medicine, is it understood that the pharmacist gave the customer a drug counselling after the phone call before handing out the replacing drug? I guess not out of the instructions. But I

guess yes out of realistic real pharmacy life. I also found it difficult with the type two diabetic case (with poor adherence) where the patient was using sweet lactulose (not the number one choice for patient category) regularly for constipation problems. It was hard to say whether the pharmacist recognised a problem with that drug selection or only adherence problems with tablets.

It was not possible to choose zero drug related problems. case 5 and 8 i was not sure how to categorize. the cases were also for primary healthcare and i am not sure how the classification could be used in a hospital setting with more complicated drug related problems.

perhaps because the points are not detailed enough, some problems lack the corresponding options in the analysis.

the classification has a lot of options, so it may sometimes become a little difficult to find out where the wanted option is placed. on the other hand, once i got to know the options a bit better it was easier.

it takes some time and practice to figure out how to use it when not used to it. after a bit practice i believe it will work just great!

i think it takes time to classify drps and i am not sure of the usability in daily professional practice.

i think it would have been interesting to try the classification on cases more in an hospital setting (as a clinical pharmacist on the wards). meaning that many of the cases were in a pharmacy setting.

las opciones planteadas para los problemas, causas e intervenciones son adecuadas sin embargo hay una que otra que son claras para resolver el problema. en la practica profesional siento que requiere demasiado tiempo para ser contestado y a veces no todos tienen el tiempo necesario ( ya sea paciente o profesional de la salud) para realizarla.

domains could be shorter

too many options for daily work

for me it was unclear between i.1.3 intervention proposed to prescriber and i1.4 intervention discussed with prescriber. in some cases i didn't know what to select. i was missing to select the result of intervention (accepted, not accepted...)

i had some problem how to code patient adherence problem. i believe it should be individual problem, a not only the cause of the problem. when i recognised two problems (case 17), i did not find the possibility to mark that. subdomain causes for patient transfer (c8.1-c8.5)- not all are clear too me it seems there is some overlapping among them. coding via the web application was helpful, because only the relevant subdomain fields opened.

i think that several problems do not fit in either of the boxes under "problems". i wish that the description in these boxes could be more detailed.

advice for patients

despite for research purposes this classification is complete and allows to clearly classify each drug-related problem, for daily practice is a very extensive list.

this is a mature classification system

it is easy to use and in this way we could help research. community pharmacist is a lot of times the first healthcare person that are asked about a problem and we must have professionalism and competence. for this reason we must be also taken in consideration when we talk about research. with kind regards.

i hope this software can provide specific help for the value of clinical pharmacists after drps.

no

i think is a very important topic so the health professionals that we already work in this, we need to make sure that we are doing the classification well in order to create a safety reports and information for the final consumer and for the industry.

the classification system is too complicated to use in a daily professional practice. it is too time-consuming. but in research i think it is good.

can be too complicated and take more time

in some cases complicated, takes too much time to use in daily practice behind the counter in the pharmacy

no way!

comments to the classification scheme: - c3.1 (drug dose too low) vs c3.3 (dosage regimen not frequent enough) - is it a need for both these causes or is it essentially the same cause? - c3.2 (drug dose too high) vs c3.4 (dosage regimen too frequent) - is it a need for both these causes or is it essentially the same cause?(e.g. in case 14) - i think it is difficult to know how to chose between p1.1 (no effect) and p1.2 (effect not optimal) e.g. in case 14 -c8.1, c8.2 and c8.3 seems a bit alike? if they all are needed, they should be additionally clarified, e.g. in case 12 it is difficult to know what actually is the cause. comments on the cases: - case 14 - difficult to know the cause as the pharmacist suggests a change which is not helping the patient - case 13 - i guess the primary problem domain is treatment effectiveness. however, as the patient do not have started the treatment yet it is impossible to say if the effect will be none or non-optimal

indeed more than one cause and intervention may be attributed to one drp. however, as many causes and interventions are overlapping, classification may be easier if confined to the selection of only one category. when classifying the planned interventions, in most instances a change in a drug requires either a consult with the patient or the physician. so maybe it would be worthy considering splitting the category into a part classifying the "action" and the "person" with whom the intervention was shared.

it would be helpful if it was easier (less steps) to do the classification. otherwise i see a risk of underuse

el desarrollo del contenido es adecuado, sin embargo en algún momento se torna cansado y complejo. en la practica profesional diaria siento que tomaría demasiado tiempo realizar la y a veces no todos contamos con ese tiempo por \"x\" o \"y\" razón .

probably too time consuming for daily use.

A very nice and detailed classification has been created. But I think it will take time to use it in daily practice. It can improve the use of integration with the mobile application. thanks.

the classification is too complex for daily use in the clinic

too time-consuming for daily practice



It's useful but in daily practice may take too much time than we have.

it was a little bit complicated to find what you were looking for. Many categories to look through. But it became easier at the end. Meaning you need to learn to use it, get to know it before you can use it not using too much time to look for appropriate choice.

Too many different classification options?