

Table S1. Questionnaire

Profile of the Respondent	
What is your gender?	Male Female Other
What is your age?	number
What is the number of patients in your practice?	number
Haw many children you have enrolled in your practice?	number
Where your practice is mainly settled?	Capital city Regional city Small town Village
What is your practice?	Solo practice Group practice
What is your specialty?	General Medicine Pediatrics Internal Medicine Other. Please, specify...
TRUST	
Please share how much you trust the following factors related to vaccines from the children's immunization calendar of the Republic of Bulgaria.	
I have trust in the information on vaccines from official authorities (WHO, ECDC)	5 point Likert Scale, ranging from Strongly agree to Strongly disagree, option for "I do not wish to answer"
I have trust in the information on vaccines from Bulgarian official authorities (MoH and others)	5 point Likert Scale, ranging from Strongly agree to Strongly disagree, option for "I do not wish to answer"
I have trust in the information on vaccines from pharmaceutical companies	5 point Likert Scale, ranging from Strongly agree to Strongly disagree, option for "I do not wish to answer"
I have trust in the information on vaccines from other GPs	5 point Likert Scale, ranging from Strongly agree to Strongly disagree, option for "I do not wish to answer"
I have trust in the practices on vaccines from official authorities (WHO, ECDC)	5 point Likert Scale, ranging from Strongly agree to Strongly disagree, option for "I do not wish to answer"
I have trust in the practices on vaccines from Bulgarian official authorities (MoH and others)	5 point Likert Scale, ranging from Strongly agree to Strongly disagree, option for "I do not wish to answer"

I have trust in the practices on vaccines from pharmaceutical companies	5 point Likert Scale, ranging from Strongly agree to Strongly disagree, option for "I do not wish to answer"
ATTITUDES TOWARDS VACCINES	
And now let's talk about the vaccines from the mandatory children's immunization calendar. Can you share your overall assessment of the following statements:	
Vaccines are important for children to have	5 point Likert Scale, ranging from Strongly agree to Strongly disagree, option for "I do not wish to answer"
Vaccines are safe	5 point Likert Scale, ranging from Strongly agree to Strongly disagree, option for "I do not wish to answer"
Vaccines are effective	5 point Likert Scale, ranging from Strongly agree to Strongly disagree, option for "I do not wish to answer"
It's good the vaccines are mandatory	5 point Likert Scale, ranging from Strongly agree to Strongly disagree, option for "I do not wish to answer"
All vaccines from the schedule are important	5 point Likert Scale, ranging from Strongly agree to Strongly disagree, option for "I do not wish to answer"
I generally approve the Bulgarian immunization calendar	5 point Likert Scale, ranging from Strongly agree to Strongly disagree, option for "I do not wish to answer"
Generally, the diseases for which there are mandatory vaccines are dangerous	5 point Likert Scale, ranging from Strongly agree to Strongly disagree, option for "I do not wish to answer"
EXPERIENCE AND HESITANCY AMONG PARENTS	
In your practice as a General Practitioner in the last 5 years, have there been any cases of illnesses from diseases against which mandatory immunizations from the children's immunization calendar in Bulgaria are currently applied?	Yes, without administered vaccine Yes, with administered vaccine No I cannot answer
In your practice as a GP in the last 5 years, have there been any cases of serious adverse effects following compulsory vaccination of children that were potentially associated with hospitalization or disability?	Yes No I cannot answer
Do the parents of children from your practice have doubts regarding the administration of vaccines from the mandatory children's immunization calendar?	Yes, often Yes, rarely No I cannot answer

Has there been a change in parents' vaccine attitudes about mandatory childhood vaccines since the start of the Covid-19 pandemic?	Yes, there are less vaccine hesitant parents Yes, there are more vaccine hesitant parents No I cannot answer
Are there children in your practice who have missed mandatory vaccinations for which they are eligible due to delay or refusal?	Yes, due to refusal Yes, due to delay Yes, due to medical reasons No I cannot answer
To what extent do you have difficulty communicating with parents regarding the vaccination of their children?	To a great extent To small extent I do not experience any difficulties in communicating with parents I cannot answer
COMMUNICATION	
How much do you agree with the following statements:	
I generally feel comfortable in front of parents when explaining about vaccines	5 point Likert Scale, ranging from Strongly agree to Strongly disagree, option for "I do not wish to answer"
I don't have enough time to spend explaining to parents	5 point Likert Scale, ranging from Strongly agree to Strongly disagree, option for "I do not wish to answer"
GPs do not have a choice to administer or not to administer vaccines – this sometimes makes communication with parents tense	5 point Likert Scale, ranging from Strongly agree to Strongly disagree, option for "I do not wish to answer"
In my practice as a general practitioner, I do not allow children to remain unvaccinated due to a parent's refusal	5 point Likert Scale, ranging from Strongly agree to Strongly disagree, option for "I do not wish to answer"
Parents who hesitate and delay vaccines hinder my work	5 point Likert Scale, ranging from Strongly agree to Strongly disagree, option for "I do not wish to answer"
I do not accept in my practice parents who do not wish to vaccinate their children	5 point Likert Scale, ranging from Strongly agree to Strongly disagree, option for "I do not wish to answer"
My role is to explain to parents the benefits of vaccines, even if they initially hesitate or refuse to vaccinate their children	5 point Likert Scale, ranging from Strongly agree to Strongly disagree, option for "I do not wish to answer"
I explain to parents the side effects of vaccines, as well as the risks of vaccine-preventable diseases	5 point Likert Scale, ranging from Strongly agree to Strongly disagree, option for "I do not wish to answer"
I try to understand parents' hesitations	5 point Likert Scale, ranging from Strongly agree to Strongly disagree, option for "I do not wish to answer"
I inform the parents, but the choice is theirs	5 point Likert Scale, ranging from Strongly agree to Strongly disagree, option for "I do not wish to answer"

I am pushing for vaccinations	5 point Likert Scale, ranging from Strongly agree to Strongly disagree, option for "I do not wish to answer"
The decision to vaccinate is the parents' responsibility	5 point Likert Scale, ranging from Strongly agree to Strongly disagree, option for "I do not wish to answer"
RECOMMENDATIONS AND OTHER QUESTIONS	
How often do you recommend vaccines that are NOT included in the mandatory immunization schedule?	Always Often Rarely Never I cannot answer
Please chose which are your three main preferred sources of information?	Official health organizations and institutions Professional associations Vaccine producers (pharmaceutical companies) Specialized medical websites Other general practitioners Medical Journals Social media groups for medics Mesia Other. Please, specify...
Which of the following would most improve your work? (up to 3 answers, multiple)	Electronic system for tracking vaccination status Automated messages to patients to remind them of their vaccination dates Special procedure for payment by patients for consultations on vaccines A hotline to give information to GPs about vaccines Electronic resources to provide new information for GPs about vaccines Leaflets on the benefits and risks of each vaccine intended for GPs Leaflets about the benefits and risks of each vaccine intended for patients Public campaigns for the benefit of vaccines Other. Please, specify...

Table S2. Relationships between Factor mean scores and general characteristics of the practice. ANOVA analysis. Mean factor scores and Std. Deviation presented.

Question		Factor mean scores
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Type of settlement		Factor1 MEAN (Active communicat or)	Factor2 MEAN (Restrictive communicat or)	Factor3 MEAN (Informing communicat or)	Factor4 MEAN (Strained communicat or)
F		2.185	22.926	12.09	8.993
Sig		0.09	0.000	0.000	0.000
The capital (Sofia)	Mean	1.6545	2.6587	1.7374	2.1094
	N	66	63	66	64
	Std. Deviation	0.63976	1.27894	0.95634	0.85202
Regional city	Mean	1.6115	2.2899	1.6643	2.3406
	N	139	138	141	138
	Std. Deviation	0.59504	1.20342	0.90105	1.06192
Small towns	Mean	1.4737	3.2684	1.1803	2.9062
	N	95	95	98	96
	Std. Deviation	0.30604	1.27957	0.43122	1.17274
Village	Mean	1.6383	3.7766	1.1884	2.2391
	N	47	47	46	46
	Std. Deviation	0.36508	1.05711	0.635	1.16304
Total	Mean	1.5856	2.8324	1.4805	2.4419
	N	347	343	351	344
	Std. Deviation	0.51601	1.33291	0.81271	1.1103
Age		Factor1 MEAN (Active communicat or)	Factor2 MEAN (Restrictive communicat or)	Factor3 MEAN (Informing communicat or)	Factor4 MEAN (Strained communicat or)
F		0.087	0.83	1.031	2.048
Sig		0.967	0.478	0.379	0.107
31-40	Mean	1.5091	2.6364	1.3636	1.6818
	N	11	11	11	11
	Std. Deviation	0.56825	1.55066	0.64039	0.71668
41-50	Mean	1.5889	2.7364	1.4906	2.4167
	N	54	55	53	54

Question		Factor mean scores			
Type of settlement		Factor1 MEAN (Active communicat or)	Factor2 MEAN (Restrictive communicat or)	Factor3 MEAN (Informing communicat or)	Factor4 MEAN (Strained communicat or)
	Std. Deviation	0.60115	1.45569	0.82328	1.03135
51-60	Mean	1.5913	2.943	1.5611	2.5219
	N	161	158	161	160
	Std. Deviation	0.51203	1.2794	0.88461	1.12623
over 61	Mean	1.5863	2.7155	1.3962	2.4174
	N	117	116	122	115
	Std. Deviation	0.48261	1.31913	0.72516	1.13155
Total	Mean	1.5866	2.8221	1.4861	2.4426
	N	343	340	347	340
	Std. Deviation	0.51702	1.33036	0.81574	1.1086
Size of the practice		Factor1 MEAN (Active communicat or)	Factor2 MEAN (Restrictive communicat or)	Factor3 MEAN (Informing communicat or)	Factor4 MEAN (Strained communicat or)
F		0.597	0.419	0.375	1.178
sig		0.665	0.795	0.827	0.32
1-1000	Mean	1.6361	2.8729	1.5269	2.275
	N	61	59	62	60
	Std. Deviation	0.60167	1.3696	0.89228	1.01441
1001-2000	Mean	1.5941	2.8413	1.4294	2.4532
	N	170	167	170	171
	Std. Deviation	0.51781	1.33318	0.75928	1.14949
2001-3000	Mean	1.5718	2.8837	1.5249	2.5542
	N	85	86	87	83
	Std. Deviation	0.50252	1.35836	0.86211	1.07355
3001-4000	Mean	1.4667	2.4333	1.6	2.2333

Question		Factor mean scores			
Type of settlement		Factor1 MEAN (Active communicat or)	Factor2 MEAN (Restrictive communicat or)	Factor3 MEAN (Informing communicat or)	Factor4 MEAN (Strained communicat or)
	N	15	15	15	15
	Std. Deviation	0.34365	1.06682	0.77868	1.13179
over 4001	Mean	1.4364	3	1.5455	2.9091
	N	11	11	11	11
	Std. Deviation	0.25009	1.28452	1.01404	1.09129
Total	Mean	1.5854	2.8447	1.4821	2.4515
	N	342	338	345	340
	Std. Deviation	0.51706	1.32997	0.81714	1.10703
Percentage of children in practice		Factor1 MEAN (Active communicat or)	Factor2 MEAN (Restrictive communicat or)	Factor3 MEAN (Informing communicat or)	Factor4 MEAN (Strained communicat or)
F		0.593	2.95	2.096	0.575
Sig		0.553	0.054	0.125	0.563
Up to 20%	Mean	1.5871	2.9438	1.4612	2.4206
	N	170	169	172	170
	Std. Deviation	0.52359	1.33344	0.81915	1.16069
21 - 40%	Mean	1.5361	3	1.3196	2.5556
	N	72	70	73	72
	Std. Deviation	0.40812	1.36997	0.54557	1.15538
Over 41%	Mean	1.6263	2.5395	1.5812	2.3667
	N	76	76	78	75
	Std. Deviation	0.5439	1.26429	0.88996	0.95625
Total	Mean	1.5849	2.8587	1.4582	2.4385
	N	318	315	323	317
	Std. Deviation	0.50439	1.33362	0.7876	1.11314

Table S3. Relationships between factors mean scores and general characteristics of the practice. Mean factor scores and St. Deviation displayed.

Factor		Question				
	Sig	Type of the GPs' practice	N	Mean	Std. Deviation	Std. Error Mean
Factor1 (MEAN) (Active communicat or)	0.911	Individual	310	1.5845	0.5045	0.02865
		Group	37	1.5946	0.61189	0.10059
Factor2 (MEAN) (Restrictive communicat or)	0.072	Individual	306	2.8775	1.30843	0.0748
		Group	37	2.4595	1.48781	0.2446
Factor3 (MEAN) (Informing communicat or)	0.812	Individual	314	1.4841	0.81862	0.0462
		Group	37	1.4505	0.77067	0.1267
Factor4 (MEAN) (Strained communicat or)	0.057	Individual	306	2.482	1.1252	0.06432
		Group	38	2.1184	0.93313	0.15137
		Gender	N	Mean	Std. Deviation	Std. Error Mean
Factor1 (MEAN) (Active communicat or)	0.575	Man	101	1.6009	0.54065	0.05380
		Women	246	1.5756	0.50634	0.03228
Factor2 (MEAN) (Restrictive communicat or)	0.02	Man	101	3.1832	1.37427	0.13674
		Women	242	2.686	1.29014	0.08293
Factor3 (MEAN)	0.311	Man	102	1.4118	0.8221	0.0814

Factor		Question				
	Sig	Type of the GPs' practice	N	Mean	Std. Deviation	Std. Error Mean
(Informing communicator)						
		Women	249	1.5087	0.8088	0.05126
Factor4 (MEAN) (Strained communicator)	0.677	Man	102	2.4804	1.12997	0.11188
		Women	242	2.4256	1.10386	0.07096
		Specialty – pediatric	N	Mean	Std. Deviation	Std. Error Mean
Factor1 (MEAN) (Active communicator)	0.923	Not pediatric	240	1.5875	0.48888	0.03156
		Pediatric	107	1.5813	0.57464	0.05555
Factor2 (MEAN) (Restrictive communicator)	0.035	Not pediatric	236	2.9343	1.30422	0.0849
		Pediatric	107	2.6075	1.37365	0.1328
Factor3 (MEAN) (Informing communicator)	0.002*	Not pediatric	242	1.3829	0.72772	0.04678
		Pediatric	109	1.6972	0.9434	0.09036
Factor4 (MEAN) (Strained communicator)	0.796	Not pediatric	240	2.4521	1.13926	0.07354
		Pediatric	104	2.4183	1.04536	0.10251
		Specialty – internal medicine	N	Mean	Std. Deviation	Std. Error Mean
Factor1 (MEAN) (Active communicator)	0.707	Not internal medicine	261	1.5916	0.5413	0.03351
		Internal medicine	86	1.5674	0.43262	0.04665

Factor		Question				
	Sig	Type of the GPs' practice	N	Mean	Std. Deviation	Std. Error Mean
Factor2 (MEAN) (Restrictive communicator)	0.635	Not internal medicine	257	2.8521	1.33739	0.08342
		Internal medicine	86	2.7733	1.32545	0.14293
Factor3 (MEAN) (Informing communicator)	0.148	Not internal medicine	264	1.4444	0.79994	0.04923
		Internal medicine	87	1.59	0.84557	0.09065
Factor4 (MEAN) (Strained communicator)	0,238*	Not internal medicine	258	2.4806	1.13813	0.07086
		Internal medicine	86	2.3256	1.01971	0.10996
		Specialty – general medicine	N	Mean	Std. Deviation	Std. Error Mean
Factor1 (MEAN) (Active communicator)	0.482	Not general medicine	122	1.6131	0.55966	0.05067
		General medicine	225	1.5707	0.49138	0.03276
Factor2 (MEAN) (Restrictive communicator)	0.004	Not general medicine	121	2.5496	1.33761	0.1216
		General medicine	222	2.9865	1.30776	0.08777
Factor3 (MEAN) (Informing communicator)	0.00*	Not general medicine	126	1.7037	0.87048	0.07755
		General medicine	225	1.3556	0.75198	0.05013
Factor4 (MEAN) (Strained communicator)	0.244	Not general medicine	121	2.3471	1.08751	0.09886
		General medicine	223	2.4933	1.12153	0.0751

*Equal variances not assumed

Table S4. Parental hesitancy and attitudes towards vaccines. ANOVA analysis.

Do the parents of children from your practice have doubts regarding the administration of vaccines from the mandatory children's immunization calendar?		Factor1 MEAN (Active communicat or)	Factor2 MEAN (Restrictive communicat or)	Factor3 MEAN (Informing communicat or)	Factor4 MEAN (Strained communicat or)
		7.626	4.41	2.227	12.512
sig		0.001	0.013	0.109	0.000
		Factor1MEAN	Factor2_meaN	Factor3MEAN	Factor4MEAN
Yes, often	Mean	1.8085	3.375	1.3958	1.7979
	N	47	44	48	47
	Std. Deviation	0.59557	1.33	0.8155	0.83834
Yes, rarely	Mean	1.6011	2.7201	1.5663	2.4293
	N	184	184	186	184
	Std. Deviation	0.49412	1.25523	0.87375	0.98231
No	Mean	1.4707	2.8043	1.3789	2.7301
	N	116	115	117	113
	Std. Deviation	0.48652	1.41374	0.6933	1.28528
Total	Mean	1.5856	2.8324	1.4805	2.4419
	N	347	343	351	344
	Std. Deviation	0.51601	1.33291	0.81271	1.1103
In your practice as a General Practitioner in the last 5 years, have there been any cases of illnesses from diseases against which mandatory immunizations from the children's immunization calendar in Bulgaria are currently applied?		Factor1 MEAN (Active communicat or)	Factor2 MEAN (Restrictive communicat or)	Factor3 MEAN (Informing communicat or)	Factor4 MEAN (Strained communicat or)
F		1.317	0.722	6.059	1.488
sig		0.269	0.487	0.003	0.227
Yes, without administered vaccine	Mean	1.5	2.875	2.1458	2
	N	16	16	16	16
	Std. Deviation	0.41952	1.53297	1.38761	0.98319
Yes, with administered vaccine	Mean	1.775	3.2188	1.6	2.3125

Do the parents of children from your practice have doubts regarding the administration of vaccines from the mandatory children's immunization calendar?		Factor1 MEAN (Active communicat or)	Factor2 MEAN (Restrictive communicat or)	Factor3 MEAN (Informing communicat or)	Factor4 MEAN (Strained communicat or)
	N	16	16	15	16
	Std. Deviation	0.80953	1.21063	0.74748	1.23659
No	Mean	1.5803	2.8103	1.4417	2.4712
	N	315	311	320	312
	Std. Deviation	0.50146	1.32933	0.765	1.10791
Total	Mean	1.5856	2.8324	1.4805	2.4419
	N	347	343	351	344
	Std. Deviation	0.51601	1.33291	0.81271	1.1103
In your practice as a GP in the last 5 years, have there been any cases of serious adverse effects following compulsory vaccination of children that were potentially associated with hospitalization or disability?		Factor1 MEAN (Active communicat or)	Factor2 MEAN (Restrictive communicat or)	Factor3 MEAN (Informing communicat or)	Factor4 MEAN (Strained communicat or)
F		0.014	2.356	1.095	2.084
sig		0.907	0.126	0.296	0.15
Yes	Mean	1.6	3.3056	1.6667	2.0588
	N	18	18	20	17
	Std. Deviation	0.59409	1.53526	0.91127	0.8639
No	Mean	1.5854	2.8117	1.4707	2.4555
	N	328	324	330	326
	Std. Deviation	0.5131	1.31674	0.80734	1.11508
Total	Mean	1.5861	2.8377	1.4819	2.4359
	N	346	342	350	343
	Std. Deviation	0.51666	1.33116	0.81346	1.10632
Has there been a change in parents' vaccine attitudes about mandatory childhood vaccines since the start of the Covid-19 pandemic?		Factor1 MEAN (Active communicat or)	Factor2 MEAN (Restrictive communicat or)	Factor3 MEAN (Informing communicat or)	Factor4 MEAN (Strained communicat or)
F		1.495	1.549	0.362	9.051
sig		0.216	0.202	0.78	0.000

Do the parents of children from your practice have doubts regarding the administration of vaccines from the mandatory children's immunization calendar?		Factor1 MEAN (Active communicat or)	Factor2 MEAN (Restrictive communicat or)	Factor3 MEAN (Informing communicat or)	Factor4 MEAN (Strained communicat or)
Yes, there are less vaccine hesitant parents	Mean	1.555	2.575	1.4167	2.3537
	N	40	40	44	41
	Std. Deviation	0.59137	1.25856	0.71211	1.10817
Yes, there are more vaccine hesitant parents	Mean	1.6716	3.0421	1.5278	2.0189
	N	109	107	108	106
	Std. Deviation	0.4948	1.30514	0.86122	0.88889
No	Mean	1.5417	2.7787	1.4821	2.681
	N	175	174	177	174
	Std. Deviation	0.52569	1.33263	0.83852	1.15064
I can not answer	Mean	1.5652	2.7045	1.3636	2.7391
	N	23	22	22	23
	Std. Deviation	0.35498	1.5404	0.51341	1.17618
Total	Mean	1.5856	2.8324	1.4805	2.4419
	N	347	343	351	344
	Std. Deviation	0.51601	1.33291	0.81271	1.1103

Table S5. Communication practices (difficulties in communication and recommendations of non-mandatory vaccines). ANOVA analysis.

To what extent do you have difficulty communicating with parents regarding the vaccination of their children?		Factor1 MEAN (Active communicat or)	Factor2 MEAN (Restrictive communicat or)	Factor3 MEAN (Informing communicat or)	Factor4 MEAN (Strained communicat or)
F		5.781	2.059	0.48	16.484
sig		0.001	0.105	0.696	0.000
To a great extent	Mean	1.9125	3.5938	1.3922	1.4706
	N	16	16	17	17
	Std. Deviation	0.47311	1.14337	0.66911	0.92653
To some extent	Mean	1.6172	2.9	1.3785	2.1207
	N	58	55	59	58

To what extent do you have difficulty communicating with parents regarding the vaccination of their children?		Factor1 MEAN (Active communicat or)	Factor2 MEAN (Restrictive communicat or)	Factor3 MEAN (Informing communicat or)	Factor4 MEAN (Strained communicat or)
	Std. Deviation	0.43413	1.24499	0.64759	0.82881
To a small extent	Mean	1.6785	2.8224	1.5121	2.1881
	N	107	107	110	109
	Std. Deviation	0.5304	1.30176	0.8334	0.89698
I do not experience any difficulties in communicating with parents	Mean	1.4831	2.7424	1.5051	2.8344
	N	166	165	165	160
	Std. Deviation	0.51506	1.38327	0.86611	1.20105
Total	Mean	1.5856	2.8324	1.4805	2.4419
	N	347	343	351	344
	Std. Deviation	0.51601	1.33291	0.81271	1.1103
How often do you recommend vaccines that are NOT included in the mandatory immunization schedule?		Factor1 MEAN (Active communicat or)	Factor2 MEAN (Restrictive communicat or)	Factor3 MEAN (Informing communicat or)	Factor4 MEAN (Strained communicat or)
F		6.513	2.63	0.946	2.911
sig		0.000	0.034	0.437	0.022
Always	Mean	1.4588	2.6893	1.3556	2.6667
	N	102	103	105	102
	Std. Deviation	0.35554	1.38641	0.76414	1.09303
Often	Mean	1.5567	2.9444	1.5438	2.4387
	N	157	153	160	155
	Std. Deviation	0.49475	1.26251	0.8348	1.09505
Rarely	Mean	1.7231	2.5781	1.5104	2.1797
	N	65	64	64	64
	Std.	0.57738	1.33992	0.73695	1.11756

To what extent do you have difficulty communicating with parents regarding the vaccination of their children?		Factor1 MEAN (Active communicat or)	Factor2 MEAN (Restrictive communicat or)	Factor3 MEAN (Informing communicat or)	Factor4 MEAN (Strained communicat or)
	Deviation				
Never	Mean	2.0222	3.5833	1.5686	2.3889
	N	18	18	17	18
	Std. Deviation	0.87283	1.29762	1.18301	1.18266
I cannot answer	Mean	1.72	2.9	1.4	1.5
	N	5	5	5	5
	Std. Deviation	0.30332	1.51658	0.36515	0.5
Total	Mean	1.5856	2.8324	1.4805	2.4419
	N	347	343	351	344
	Std. Deviation	0.51601	1.33291	0.81271	1.1103