

Patterns of Antibiotic Prescription in Implant Dentistry and Antibiotic Resistance Awareness Among European Dentists: A Questionnaire-based Study

Brunello G, Becker K, Gurzawska-Comis K, Klinge K, Lund B



Objectives

Antimicrobial resistance has become an alarming global public health concern, threatening the effective treatment of common infections. This phenomenon has been fostered by the improper prescription of antibiotics by general dentists and specialists.



Aims of this survey-based study

- to elucidate the patterns of antibiotic prescription among European dentists
- to investigate their awareness of antibiotic resistance



Material and Methods

- Anonymous validated online questionnaire
- For validation: pilot group of 15 experts in periodontology and implant dentistry
- Survey in English using an online survey platform (SurveyMonkey®)
- Invitation to participate via e-mail through  to 6431 recipients →
(i.e. EAO members at least for 1 year since 2018 / participation in at least 1 recent conference)
- 17 structured questions
 - informed consent
 - demographic variables
 - working environment
 - clinical experience
 - attitude towards antibiotic prescription
(in relation to implant dentistry / COVID-19 pandemic)
 - awareness of antibiotic resistance
- Data collection: April to May 2023
- Inclusion criteria: to be a dentist and working in Europe
→ undergraduate dental students, dental hygienists and dentists working outside Europe were invited not to proceed with the survey

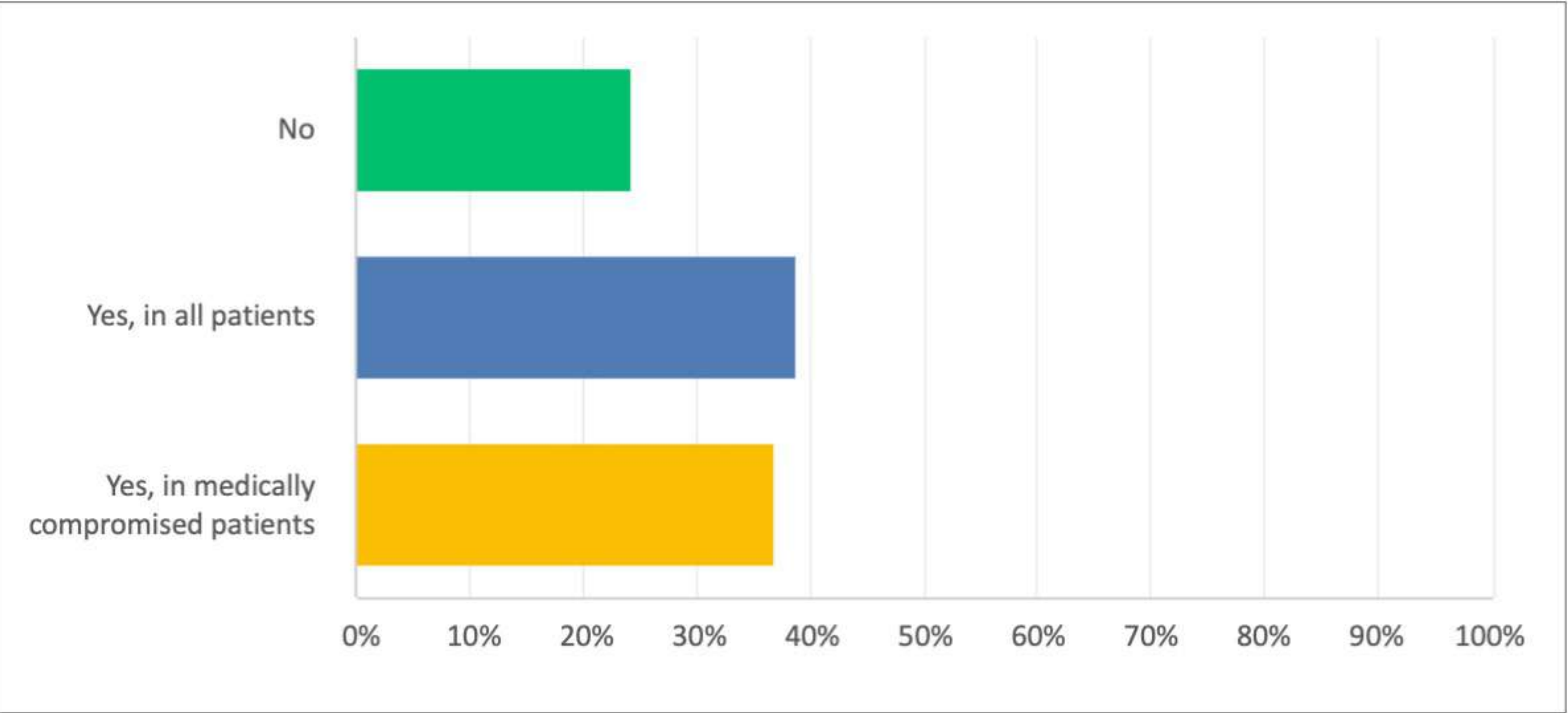
Results

- 337 access the survey link, of whom 281 completed the questionnaire → response rate 83.38%
- Mostly represented countries (n>20 dentists): Germany, Italy, Portugal and Switzerland

Category	Selected answers	Frequency	%
Gender	Male	214	76.2
	Female	64	22.8
	Diverse	0	0.00
	I prefer not to specify	3	1.1
Graduation year	In the last 5 years	19	6.8
	6-10 years ago	36	12.8
	> 10 years ago	226	80.4
Professional specialization*	Oral surgery	98	34.9
	Oral and maxillofacial surgery	32	11.4
	Prosthodontics	47	16.7
	Periodontology	84	29.9
	None (general practitioner)	56	19.9
	Other	20	7.1
Professional working environment*	Private practice	239	85.1
	Hospital	30	10.7
	University Hospital/ Dental Clinic	105	37.4
	Public Dental Care	14	5.0
	Other	3	1.1
District of the main working activity	Big city of > 1 million inhabitants	89	31.7
	Big town/city of > 200,000 inhabitants but < 1 million	98	34.9
	Small town < 200,000 inhabitants	74	26.3
	Village/Countryside	20	7.1
Implants placed per year	None	23	8.2
	1-50	64	22.8
	51-100	67	23.8
	>100	127	45.2
Surgical treatments of peri-implantitis per year [§]	None	63	22.7
	1-50	195	70.4
	51-100	16	5.8
	>100	3	1.1

* Multiple choice possible; [§] total respondents 277/281

- Most commonly prescribed antibiotics in relation to implant placement: amoxicillin alone (61.1%) or plus clavulanic acid (55.9%), clindamycin (32.3%)
- Almost 80% affirmed to routinely prescribe antibiotics as prophylaxis as well as after implant placement, especially in medically compromised patients or bone grafting
- Among dentists prescribing antibiotics as prophylaxis in all patients, 54.6% prolonged the prescription beyond the day of surgery



Antibiotic prescription as prophylaxis

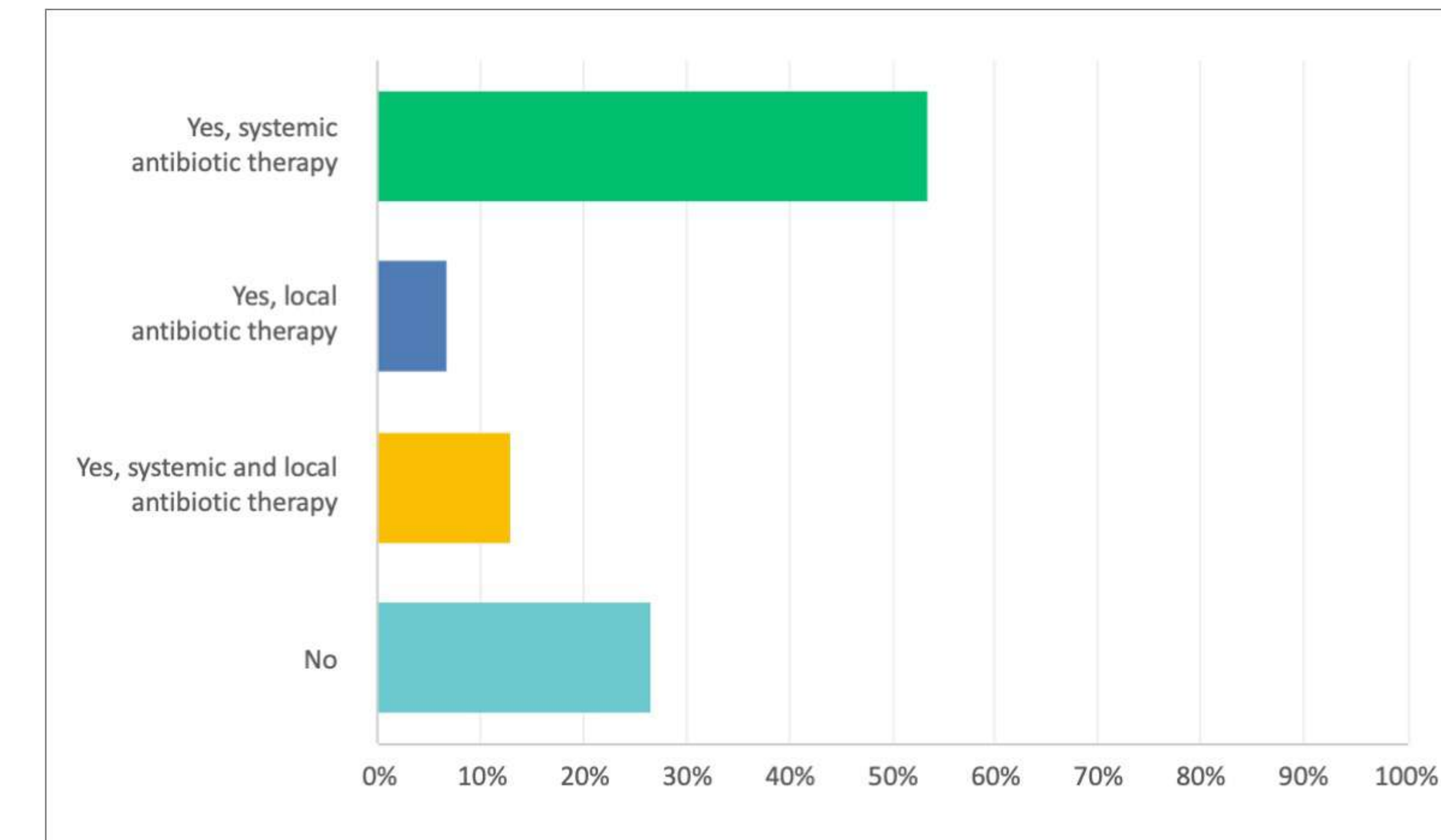
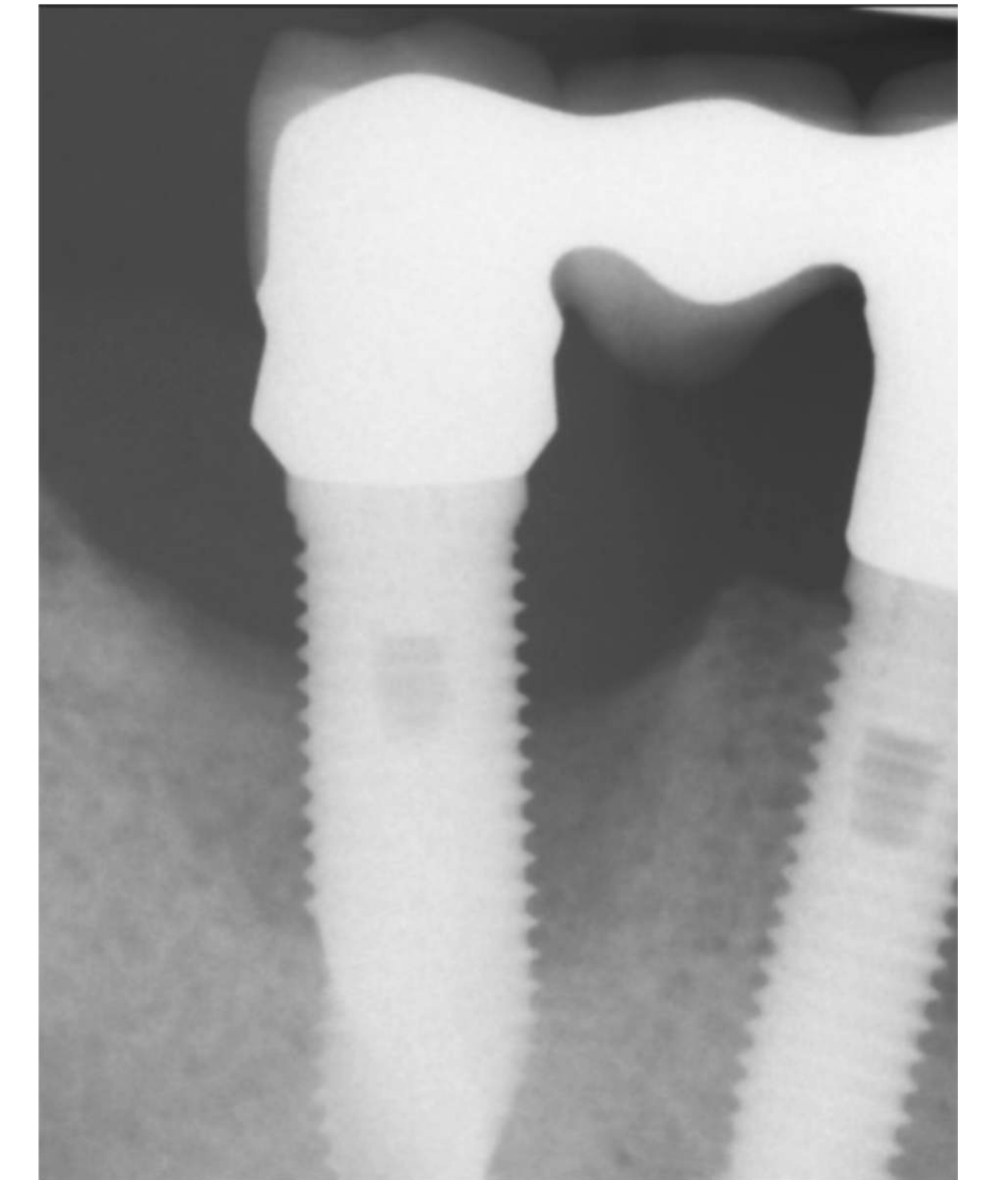
- males > females (OR=14.99, p<0.001)
- dentists graduated ≤ 10 years before by trend > others (OR=2.58, p=0.07)
- dentists placing >100 implants per year slightly > others (OR=1.27, p=0.46)
- dentists working only in private practice ≈ others (OR=0.91, p=0.76)

* Fischer's exact test

Results

Antibiotic Prescription for the Treatment of Peri-implantitis

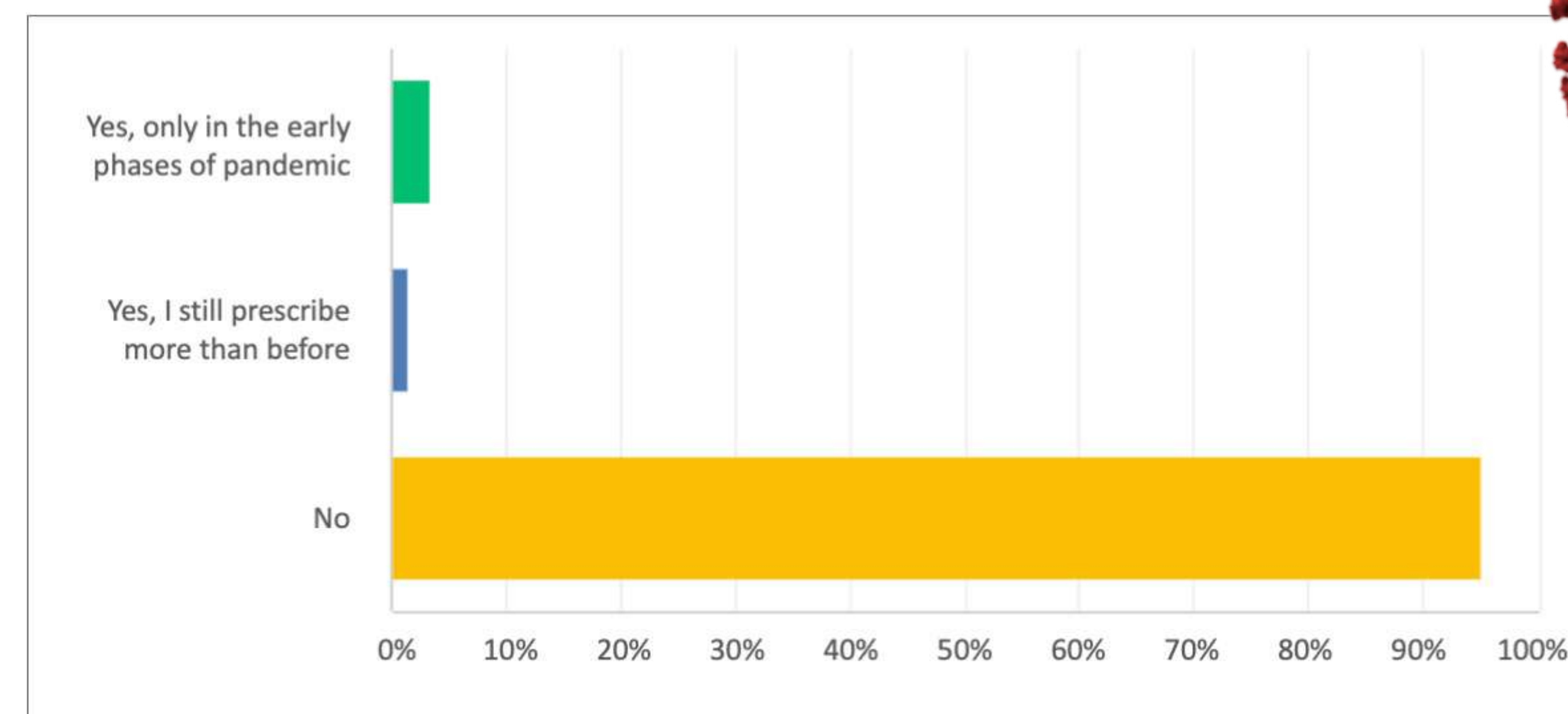
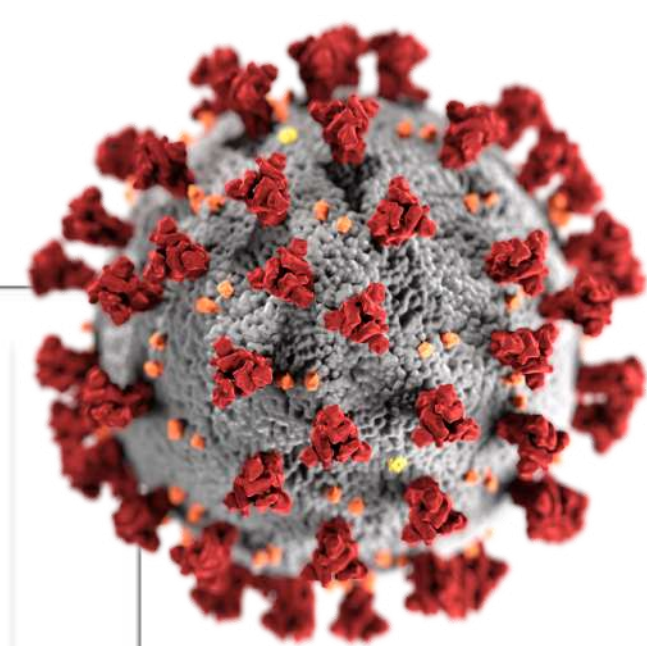
- Pronounce difference in antibiotic prescription for the **treatment of peri-implantitis** between dentists with or without specialization (Fischer's exact test: $OR=2.45$, $p=0.051$) → specialists main utilizers and the only ones using local antibiotics alone



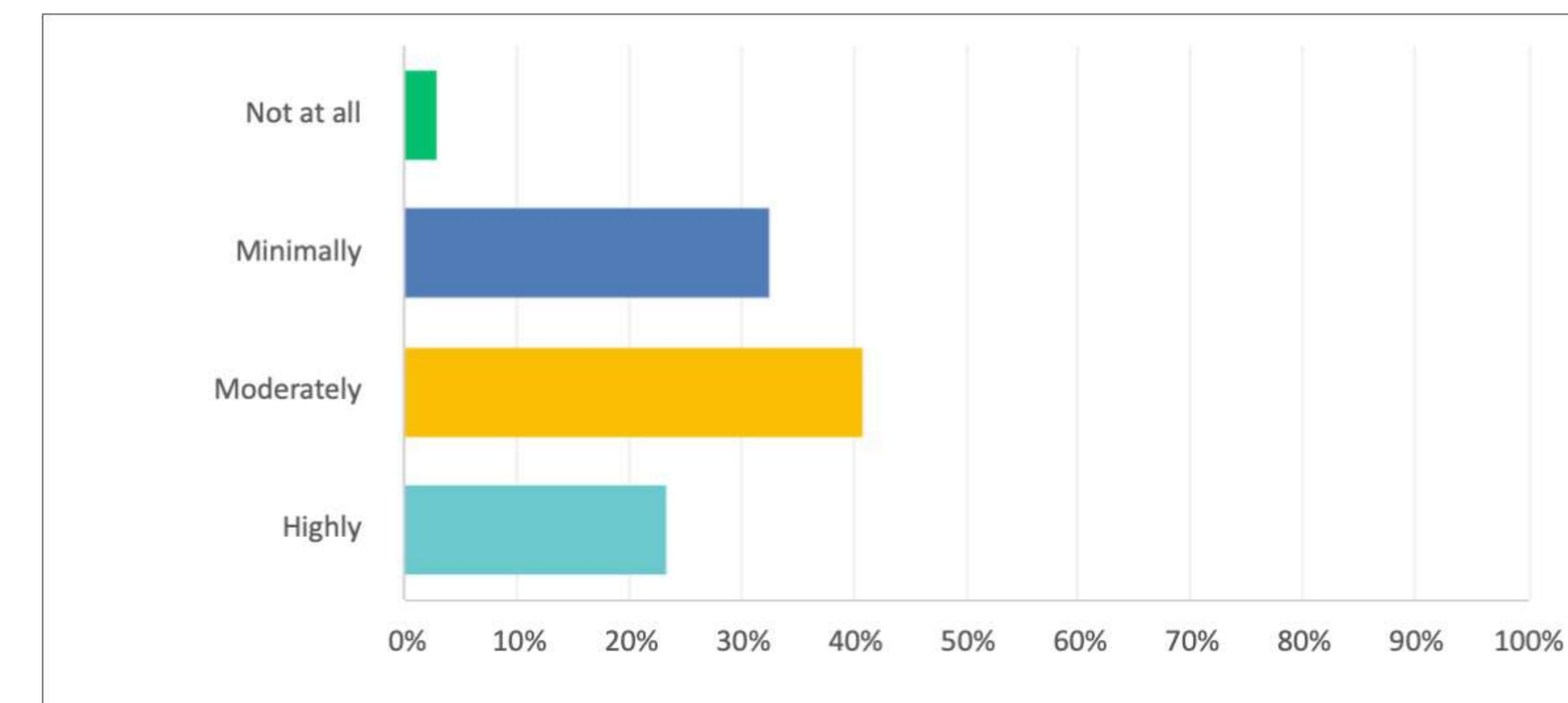
Other Items

- Adherence to national guidelines** for antibiotic prescription in dentistry: yes (37.8%), not aware national guideline (34.1%), no (28.1%)
- Personal attitude** towards antibiotic prescription since the beginning of **COVID-19 pandemic**: not increased (95.1%)
- Only a minority did not recognized the **role of dentists** in contributing to the growing **antibiotic resistance** (3.1%)

Have you prescribed more antibiotics since the beginning of COVID-19 pandemic?



To what extent do you think that dentists are contributing to the growing antibiotic resistance?



Conclusions

- High prescription rate of antibiotics for dental implant procedures in Europe, despite a considerable level of awareness about antibiotic resistance
- Inconsistency in prescription attitudes among responders
- Lack of clear guidelines about antibiotic prescription in implant dentistry in several European countries
- Development and adherence to European guidelines have been identified as a potential strategy for improving antimicrobial stewardship

