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GENERAL INTEREST

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Structure of multidisciplinary heart teams, a survey-based heart team study

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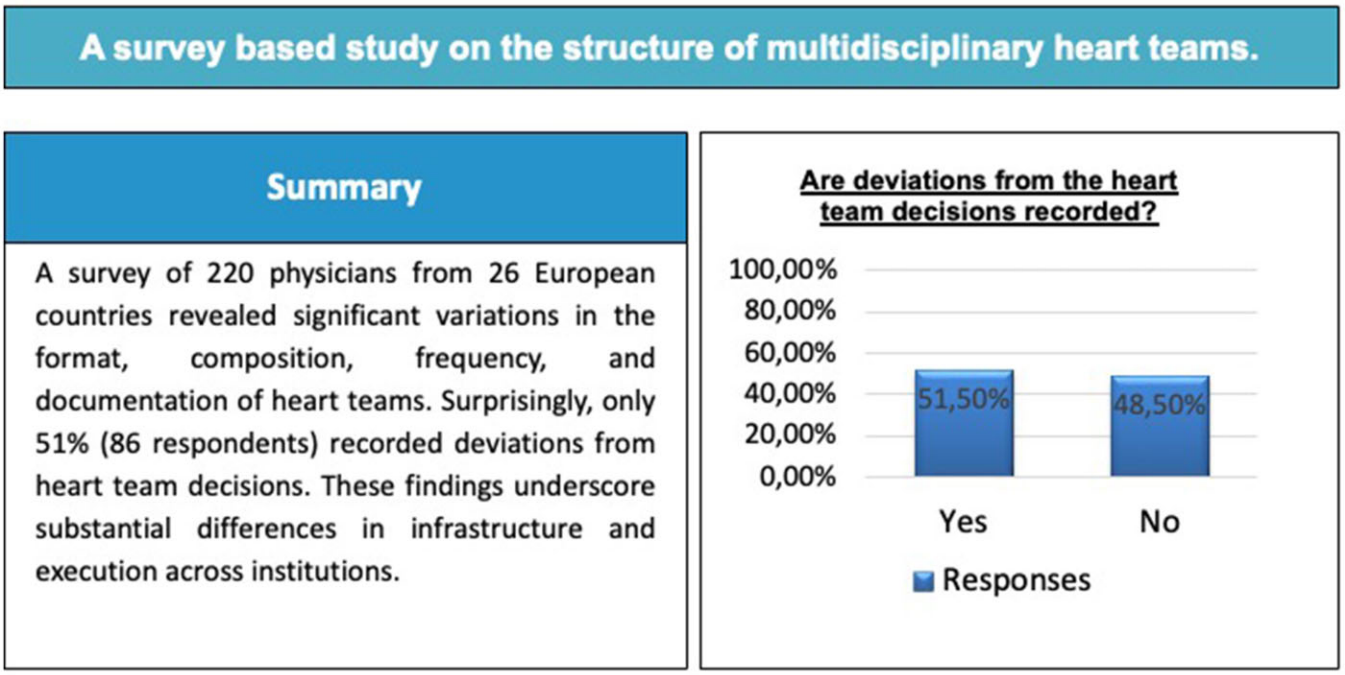

Legend: Figure depicting difference in practices of heart teams in different institutions.

Abstract

OBJECTIVES: Multidisciplinary approach is well established in various disciplines, with evidence highlighting improved patient outcomes. The objective of this survey was to determine the real-world practice of heart teams across Europe.

METHODS: The survey was drafted after a consensus opinion from the authors. The survey was sent to cardiac surgeons and cardiologists identified through electronic search. The survey link and the information sheet were sent through email followed by survey completion reminders. The survey responses were cumulated and analysed.

RESULTS: Among 2188 invited clinicians, 220 clinicians from 26 countries took part in the survey (response rate 10%). The completion rate for the survey questions was 85%. A total of 140 (64%) were cardiac surgeons and 80 (36%) were cardiologists. The heart team meeting frequency was weekly according to 104 (55%) respondents. This was conducted face to face according to 139 (73%) of the responses. Eighty-seven (56%) of the respondents reported 10–20% of patients undergoing percutaneous coronary intervention were discussed at the heart team meeting. Seventy-nine (47%) respondents had ad hoc percutaneous coronary intervention institutional guidelines. Fifty-four (32%) respondents reported an audit process for the heart team decisions.

CONCLUSIONS: This survey suggests that there is marked variability in the infra-structure and execution of heart teams in different institutions. The results of the survey suggest a need to formulate guidelines on the composition and execution of heart teams which may result in an increase in transparency of decision-making within different institutions in reporting and comparing outcomes.

Keywords: Multidisciplinary team • Heart team • Cardiovascular disease

ABBREVIATION	
PCI	Percutaneous coronary intervention

INTRODUCTION

The concept of multidisciplinary teams is well established [1, 2]. With the increasing complexity of patient with heart disease and the variety of interventions available, a multidisciplinary approach is paramount for optimizing the patient outcomes [3]. Although the concept of the heart team is a class I indication in both European and US guidelines, the level of evidence is C [4]. The centres that have integrated these guidelines perform as a highly functioning team with evidence of improvement in patient outcomes [5]. However, the current practice regarding the ideal definition, the ideal composition, the desired goals, the means of implementation, metrics of success and unintended consequences of an optimally functioning heart team are still lacking. The aims of the heart team survey were to determine whether the heart team approach is being applied in the different institutions across Europe and to determine the real-life practices of patient management in each institution.

METHODS

The study represents a pilot survey of contemporary opinion-based routines at different institutions. The survey was drafted after a consensus from the authors. Approval was obtained from the medical ethics committee at the Maastricht University Medical Centre (2021–3013). Consent was obtained from participants to take part in the online survey and use of data for publication. The cardiologists and cardiac surgeons in Europe were identified through member databases on cardiology and surgical societies according to the country of work, emails were then obtained by searching publications of the identified clinicians using PubMed. Invitation emails were sent with the survey link to individuals along with an information leaflet about the survey. Reminder emails were also sent to individuals who had not completed the survey. Survey Monkey was used to facilitate the completion of the survey. The survey responses were anonymous. These clinicians were contacted to answer a list of 47 questions (Supplementary Material, Appendix S1) focusing on the composition of heart team in different institutions, execution of the heart team, institutional guidelines for *ad hoc* interventions, documentation of heart team decisions, understanding the decision-making progress of the heart teams and the audit of heart team decisions (Supplementary Material, Appendix S1). Responses to the multiple-choice questions were tabulated and presented as bar graphs, while open-ended answers were summarized in tables. The Y axis scale of the figures (percentage) were optimised to highlight differences in the answer choices. The figures where participants were allowed to pick multiple answers for each question, the percentage in the bar chart for each choice was based on the number of participants choosing that answer.

RESULTS

Participant demographics

Among 2188 invited clinicians, 220 from 26 countries (from 105 different cities) (Fig. 1a/b) took part in the survey (response rate 10%, the survey response does not take into consideration problems with recipient email servers or emails filtered into the junk folder). The completion rate for the survey questions was 85%. One hundred and forty (64%) were cardiac surgeons and 80 (36%) were cardiologists (Fig. 1c). The subspeciality interest is shown in Fig. 1d. Seventy percentage of the responders were >40 years of age (Fig. 1e). One hundred and forty-one (64%) were working in university hospitals (Supplementary Material, table 1).

Composition of heart team

Two hundred and one respondents (91%) had a heart team in their hospitals (Fig. 2a). Over 50% of the respondents reported the heart team should comprise a cardiac surgeon, general cardiologist, interventional cardiologist, imaging cardiologist and/or anaesthetist (Fig. 2b). One hundred and nine (109, 54%) respondents reported there should be a minimum quorum required for a heart team meeting to take place (Fig. 2c). Over 50% of the respondents agreed that at least one of the following attendees is mandatory for the heart team meeting: general cardiologist, imaging cardiologist, interventional cardiologist, cardiac surgeon and heart team coordinator (Fig. 2d). Eighty-two (41%) respondents reported the presence of a meeting chair (Supplementary Material table 2a). When the respondents were asked who chairs the meeting the

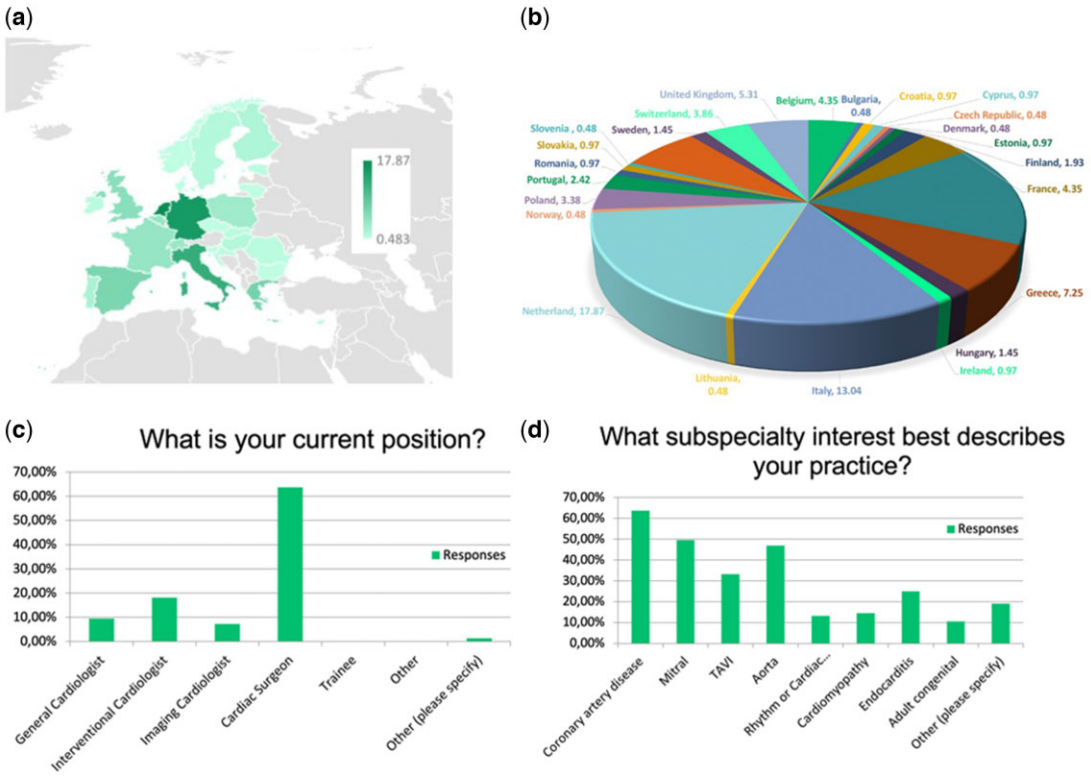

Figure 1: Selection of questions regarding participant demographics. (**a**) Map representing origin of respondents from different countries as depicted by different shades. (**b**) Pie chart representing origin of respondents from different countries. (**c**) Position as subspeciality. (**d**) The main practice area.

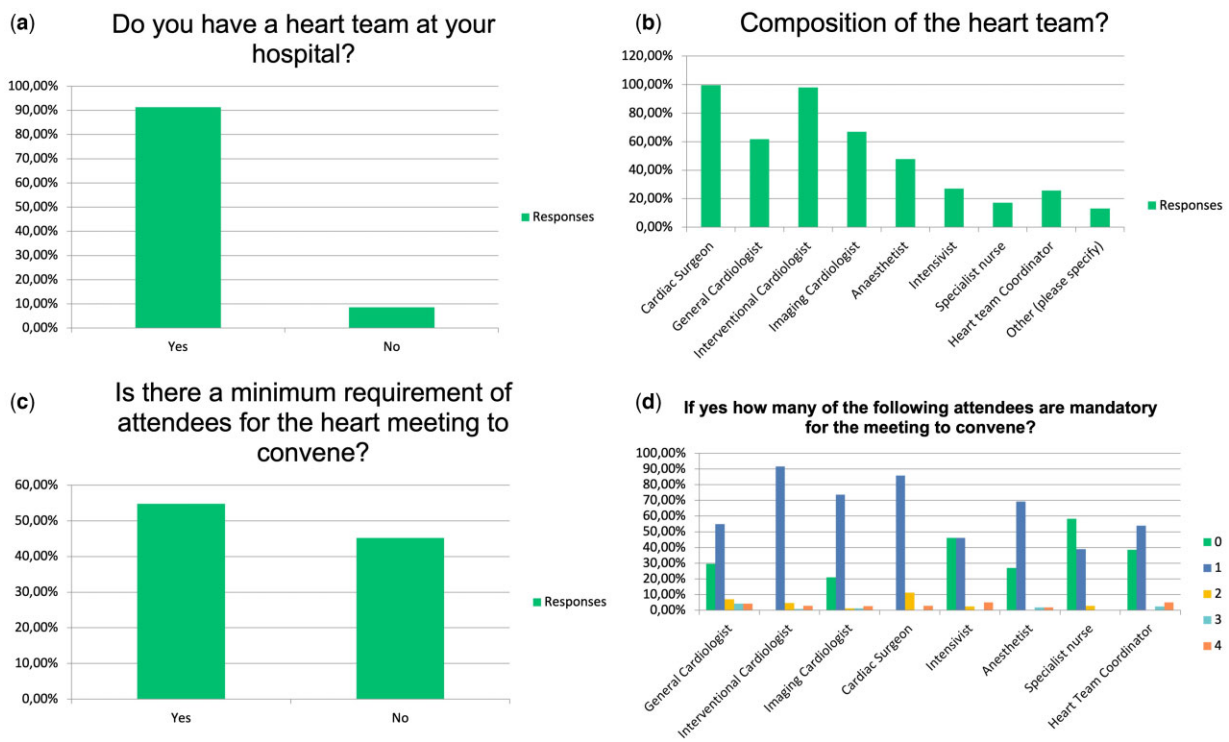

Figure 2: Questions regarding the heart team. (**a**) Whether there is a heart team. (**b**) The composition of the heart team. (**c**) Minimum attendees requirements. (**d**) The number of attendees and their subspecialisation.

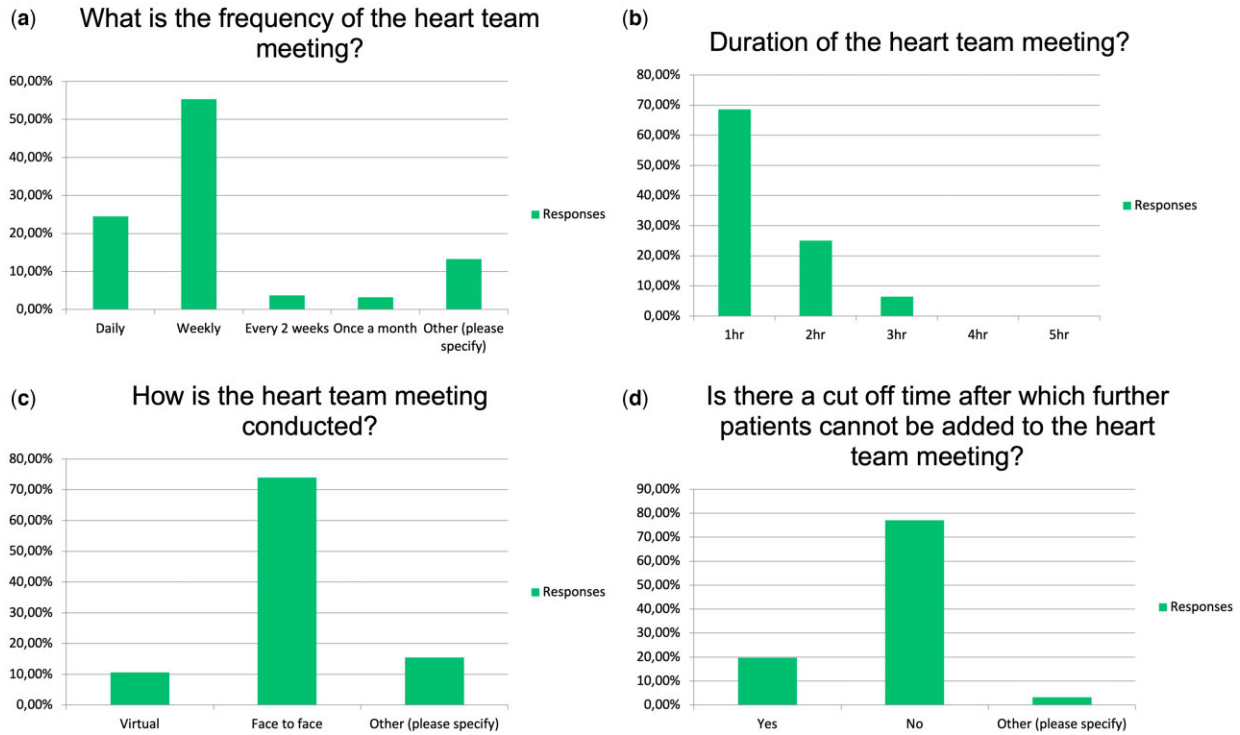

Figure 3: Selection of questions regarding the conduct of the heart team.

answer was very variable ranging from head of department, cardiac surgeon, cardiologist or on a rotational basis (Supplementary Material table 2b).

Conduct of the heart team

One hundred and four (55%) respondents had weekly heart team meetings (Fig. 3a). One hundred and twenty-nine (66%) respondents reported the heart team meeting lasted for an hour (Fig. 3b) and 139 (73%) respondents had in-person meetings (Fig. 3c). One hundred and forty-five (77%) respondents reported a lack of cut-off time for patients to be added to the heart team meetings (Fig. 3d). One hundred and six (56%) respondents circulated a patient list in advance of the heart team meetings (Supplementary Material table 3a). Fifty-eight (54%) of the respondents acknowledged the patient list was prepared by the heart team coordinator (Supplementary Material table 3b). Ninety-five (50%) of the heart teams had a regional referral system (Supplementary Material table 3c).

Type of patients discussed

One hundred and fifty-five (82%) of the respondents acknowledged that most patients undergoing percutaneous coronary intervention (PCI) were not discussed in the heart team meeting (Fig. 4a). Eighty-seven (56%) of the respondent considered 10–20% of the patients undergoing PCI were discussed (Fig. 4b). Eighty-two (49%) respondents reported a lack of institutional guidelines for *ad hoc* PCI or other ad hoc interventions (Fig. 4c). The percentage of ad hoc PCI carried out in the respondent's institution was quite variable (Fig. 4d).

Data presentation and documentation

Ninety-eight (58%) respondents reported an electronic documentation process (Fig. 5a). Ninety-six (57%) of the respondents used a patient template for clinical information at the heart team meetings(Fig. 5b). Sixty-eight (40%) of the respondents had a video presentation of the patient during heart team discussions (Fig. 5c). One hundred and three (61%) respondents reported all investigations had to be completed prior to discussion in the heart team meeting (Fig. 5d). One hundred and forty (83%) respondents reported, patients were re-discussed if further investigations were required (Supplementary Material table 5a). Euroscore was the most common risk stratification scoring system used (Supplementary Material table 5b). According to one hundred and twelve (67%) of the respondents, the SYNTAX score was not calculated for coronary artery disease patients (Supplementary Material table 5c). The frailty assessment tool was used by 75 (44%) respondents (Supplementary Material table 5d). Dementia screening was sparingly used (Supplementary Material table 5e).

Dedicated heart teams

The majority of the respondents acknowledged the presence of dedicated heart teams including transcatheter aortic valve implantation, surgical valve replacement or repair, infectious endocarditis, complex or high-risk case and adult congenital (Fig. 6a). In the case of complex cases, 70 (41%) respondents reported that anaesthetists were the additional team members who were invited to the heart team meetings (Fig. 6b). In the cases of dedicated heart team meetings, the majority of the respondents reported that the cases were done jointly by cardiologists and cardiac surgeons (Fig. 6c). The frequency of dedicated heart teams was weekly as per 105 (62%) of the respondents (Fig. 6d).

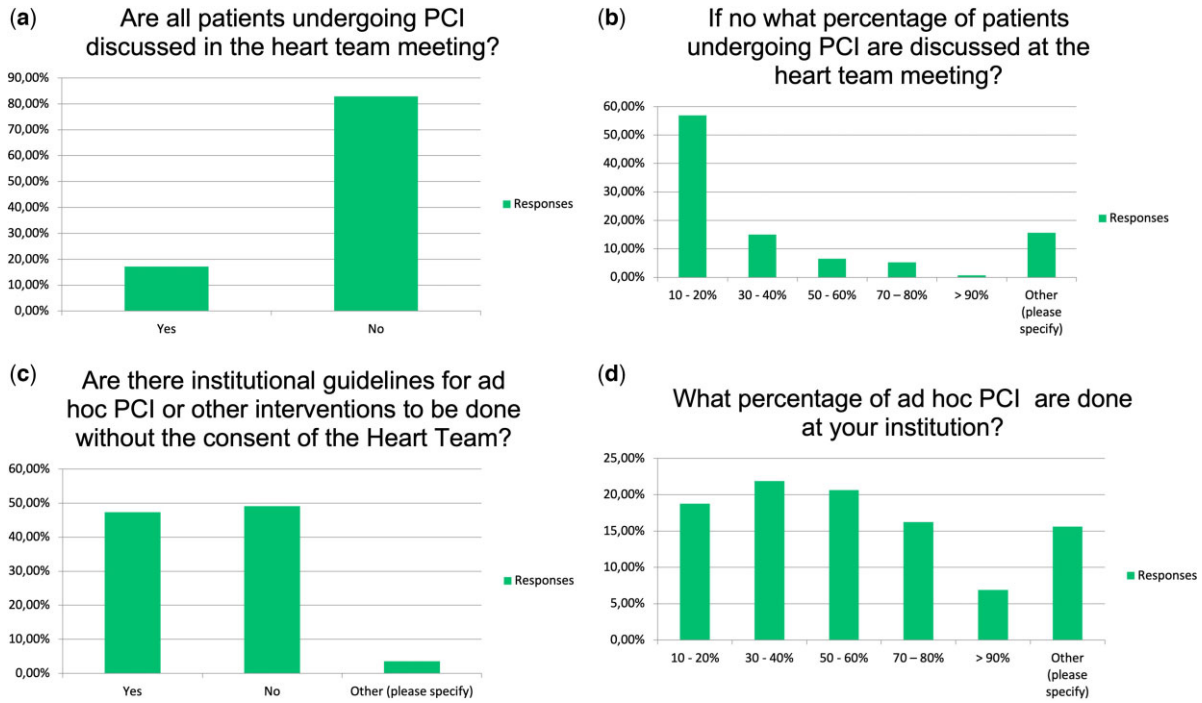

Figure 4: Selection of questions regarding the types of patients discussed.

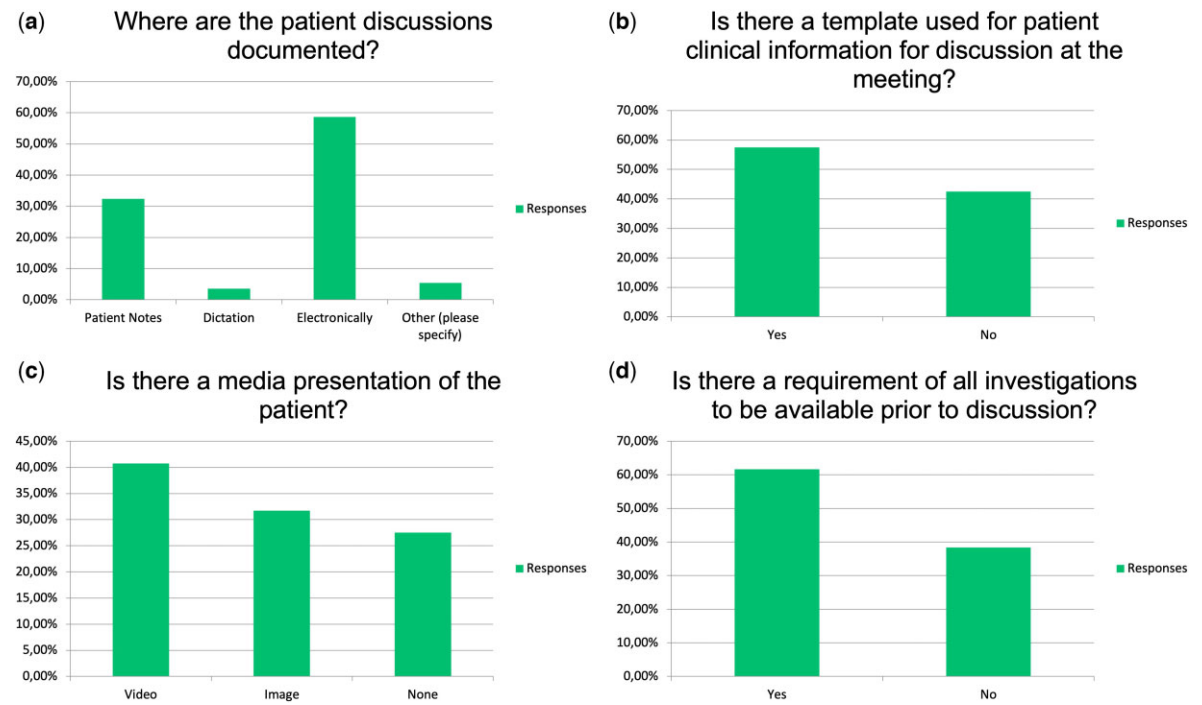

Figure 5: Selection of questions regarding data presentation and documentation.

Decision-making and auditing process for the heart team

One hundred and thirty-nine (83%) respondents reported the decision-making process of the heart team was guideline directed (Fig. 7a). The respondents reported a combination of factors that would influence the treatment modality including risk score, co-morbidities, clinical expertise and patient choice (Fig. 7b). One hundred and twenty-nine (77%) acknowledged lack of re-imbursements for the heart team meetings (Fig. 7c). Respondents were asked about resolution process for lack of consensus for patient management, the answers ranged from

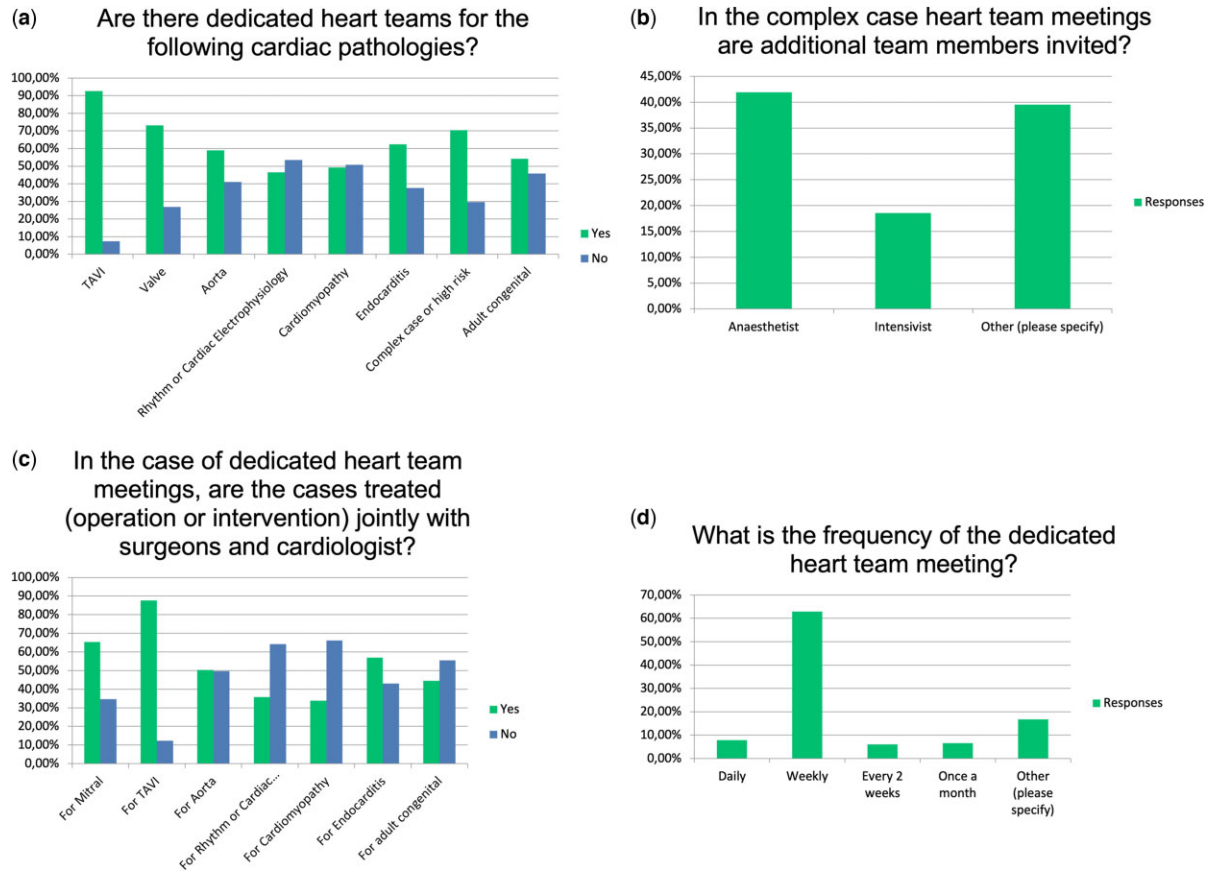

Figure 6: Selection of questions regarding dedicated heart teams.

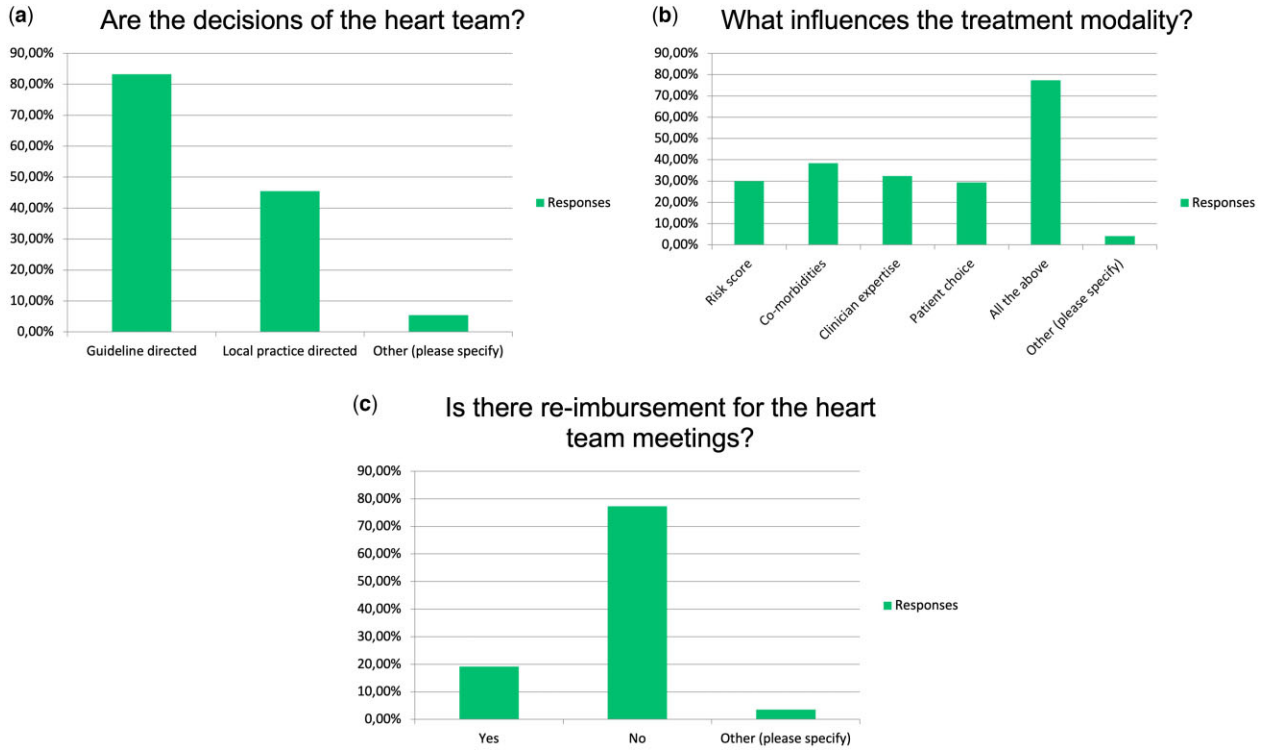

Figure 7: Selection of questions regarding the decision-making process and re-imbursement of the heart teams.

majority opinion, opinion of the referring cardiologist, going back to the patient, decision of chair, etc. (Supplementary Material, table 7a). One hundred and thirteen (67%) respondents reported a lack of auditing process for heart team decisions (Supplementary Material, table 7b). One hundred and twenty (71%) of the respondents reported lack of use of a quality indicator tool for heart team decision outcomes (Supplementary Material, table 7c).

DISCUSSION

The heart team concept stems from 2 landmark papers, the SYNTAX and the PARTNER studies where an interventional cardiologist and a cardiac surgeon determined the eligibility of the trial patients [6]. Since these trials, both European and US guidelines have identified the requirements for a collaborative heart team approach as a class I indication in the management of cardiovascular disease [4, 7]. Multiple studies have highlighted the importance of the heart team approach in the management of increasingly complex patients with a wide variety of different treatment options in the armamentarium [3, 6, 8, 9]. Despite the passage of over a decade since the inception of the heart team for the management of cardiovascular pathologies, the complete implementation is still lacking.

The current survey was carried out to establish the functionality of the heart team in different institutions. Over 201 (90%) respondents had a heart team in their hospitals. There was a wide variation in opinions of the conduct of the heart team in different institutions. Although the European guidelines highlighted the composition of the heart team to comprise of clinical cardiologist, interventional cardiologist, cardiac surgeon, imaging specialist and cardiovascular anaesthesiologist, only 50% of respondents related to it. Similarly, only 109 (54%) respondents reported the presence of a minimum quorum for a heart team meeting to take place. Archbold *et al.* [3] have highlighted the importance of the meeting chair in the conduct of heart team meetings, particularly in complex cases and where differences of opinion existed. However, in the survey, only 82 (41%) respondents reported the presence of a meeting chair at their heart teams. Fifty-one (25%) respondents identified the presence of a heart team coordinator (Fig. 2b). The importance of the heart team coordinator cannot be over-stressed as highlighted by Luckraz *et al.* [9], in particular to ensure the smooth referral process, documentation and implementation of the heart team decisions [3]. Similar to the recommendations of Luckraz *et al.*, the survey found over 60% of the respondents had weekly heart team meetings that last for an hour (Fig. 3). There was marked variability in the documentation process, clinical information template used and the completeness of investigations to be available prior to patient discussion (Fig. 5) highlighting the need for consensus heart team guidelines.

Not all patients undergoing PCI were discussed in the heart team meeting (Fig. 4a). There was also a lack of institutional guidelines for *ad hoc* PCI or other ad hoc interventions if a prior heart team discussion had not taken place as per 82 (49%) respondents (Fig. 4c). Archbold *et al.* [3] also highlighted the consideration of a model for daily and mini-heart team meetings in the context of urgent and emergency referrals.

With increasing patient complexities, advances and emergence of new therapies for cardiac pathologies, the importance of dedicated heart teams cannot be overstated. The rationale behind the dedicated heart team is to bring clinicians to the table who are experts in the same pathology but with different skill sets. The survey highlighted the presence of dedicated heart teams for different cardiac pathologies (Fig. 6). This allows a more patient-centred approach and tailors the therapy to the requirement of the patient. Similarly, Sardari Nia *et al.* [5] highlighted and reinforced the impact of a well-functioning dedicated mitral heart team on patient management with resultant improvement in patient survival.

The decision-making process of the heart team was based on several factors including risk score, co-morbidities, patient choice and clinical expertise (Fig. 7). Continuous evaluation of outcomes with quality review and/or local/external audit is a requirement of an ideal heart team. Most respondents reported a lack of an auditing process or use of a quality indicator tool for the heart team decision outcomes (Supplemental Material, Table 7b/7c) (Fig. 6e/f). This is important of 2021 European Society of Cardiology (ESC)–European Association for Cardiothoracic Surgery (EACTS) valvular guidelines in which the heart team approach is mentioned over 60 times and many controversial decision-makings are referred to the heart team.

There are several limitations of the survey including the low response rate. The responses may be individual viewpoints rather than departmental practices. There may be a lack of complete representation of heart team centres across Europe.

Nevertheless, the survey highlights marked variability in the infra-structure and execution of the heart team meetings in different institutions which have been echoed in the literature. The survey identifies the need for heart team guidelines to be formulated. These guidelines may help to reduce the marked variation in practices seen in this survey. The ultimate goal is a patient-centred approach to the management of cardiovascular pathology to improve both short-term and long-term outcomes.

SUPPLEMENTARY MATERIAL

Supplementary material is available at *ICVTS* online.

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Conflict of interest: none declared.

DATA AVAILABILITY

The survey data presented in this article can be obtained from the journal upon request.

Author contributions

Umar Imran Hamid: Data curation; Formal analysis; Investigation; Methodology; Writing—original draft; Writing—review & editing. **Thomas Modine:** Formal analysis; Writing—review & editing. **Jos Maessen:** Formal

analysis; Writing—review & editing. **Arnoud van 't Hof:** Formal analysis; Writing—review & editing. Lars Sondergaard: Formal analysis; Writing—review & editing. **Sabine Bleiziffer:** Formal analysis; Writing—review & editing. **Patrizio Lancellotti:** Formal analysis; Writing—review & editing. **Matthias Siepe:** Formal analysis; Writing—review & editing. **Peyman Sardari Nia:** Conceptualization; Data curation; Formal analysis; Supervision; Writing—original draft; Writing—review & editing.

Reviewer information

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