

## Editorial - Thoracic oncologic

# A survey of opinions and beliefs concerning surgery for malignant pleural mesothelioma amongst 802 members of the European Association for Cardio-Thoracic Surgery (EACTS), the European Society of Thoracic Surgeons (ESTS) and the Society of Thoracic Surgeons (STS)

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Malignant pleural mesothelioma (MPM) incidence continues to rise in Europe [1]. The UK has one of the highest national incidences in the world, due to peak between 2011 and 2015 [2] and Western Australia is believed to have the highest regional incidence [3]. There is likely to be an increasing incidence of this disease in countries where asbestos use continues and where its use is not well-regulated [4]. There is an important role for thoracic surgeons in helping to provide a prompt and reliable diagnosis and in palliation of pleural fluid so surgeons will continue to be involved in the care of these patients, but the benefits of various forms of extirpative surgery are contentious and as yet unresolved.

Consideration of clinical trials of surgery continues – in the UK as a sequel to the Mesothelioma and Radical Surgery (MARS) trial [5] and across Europe as a sequel to European Organisation for Research and Treatment of Cancer (EORTC) 08031 [6]. In planning future studies, it is essential to gauge the prior beliefs and opinions of surgeons; recruitment is inevitably difficult and a randomised study of an intervention is only achievable where there is some balance of prior belief for and against effectiveness. The Thoracic Domain of the European Association for Cardio-Thoracic Surgery (EACTS) proposed a survey of opinions and beliefs on the perceived effects and benefits of different surgical strategies; the survey was adopted by the European Society of Thoracic Surgeons (ESTS) and the Society of Thoracic Surgeons (STS). It should be noted that the survey was completed before MARS or EORTC 08031 results were known.

## 1. Questionnaire design

A questionnaire exploring opinions and beliefs concerning the role of surgery in MPM was designed by two of the authors (Tom Treasure and Eveline Internullo) and was piloted amongst members of EACTS' Thoracic Domain ( $n=7$ ) to check for clarity in question formulation. Members of EACTS, ESTS and STS were invited to complete the survey online in a commercially available format ([www.surveymonkey.com](http://www.surveymonkey.com)). Members of more than one society were asked to answer the survey only once. Responses were collected anonymously.

The questionnaire, consisting of 50 questions (see Table 1) related to the role of surgery in the treatment of MPM. The surgery was identified as extrapleural pneumonectomy (EPP), pleurectomy/decortication (PD), and debulking, each considered alone or within multimodality therapy. Questions focussed on in this report were the likelihood of cure, prolongation of life, and improvement in breathing with these treatments for patients with epithelioid mesothelioma. An abbreviated question set addressed the same issues with regard to sarcomatoid mesothelioma. Demographic data were also gathered (type of practice, years in practice, unit size, country of practice). Definitions of some keywords ['radical surgery', 'EPP', 'PD', 'debulking', 'video-assisted thoracic surgery (VATS)', 'pleurodesis', and 'cure'] were given at the beginning of the questionnaire to ensure clarity and consistency.

For organizational reasons, the questionnaire was opened to EACTS, ESTS and STS at different times between 5th August and 10th September 2009 and the survey was closed on 24th November 2009. The resulting online collecting

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Table 1. The questions posed in the survey of opinions and beliefs. In most instances these were yes/no responses. In some there were several fixed options presented

1. Do you believe that radical surgery by EPP alone can ever cure MPM?
2. What is your opinion as to the cure rate from EPP alone?
3. Do you believe that radical surgery by PD alone can ever cure MPM?
4. What is your opinion as to the cure rate?
5. Do you believe that EPP with adjuvant/neoadjuvant chemotherapy can ever cure epithelioid MPM?
6. What is your opinion as to the cure rate?
7. Do you believe that PD with adjuvant chemotherapy can ever cure epithelioid MPM?
8. What is your opinion as to the cure rate?
9. Do you believe that EPP as part of trimodality therapy can ever cure epithelioid MPM?
10. What is your opinion as to the cure rate?
11. Do you believe that the operation of EPP itself can gain prolongation of life?
12. What is your opinion as to the average gain in months from EPP?
13. Do you believe that the operation of EPP (as a component of any multimodality therapy) can gain prolongation of life?
14. What is your opinion as to the average gain in months from EPP (as a component of any multimodality therapy)?
15. Do you believe that the operation of PD itself can gain prolongation of life?
16. What is your opinion as to the average gain in months from PD?
17. Do you believe that the operation of PD (as a component of any multimodality therapy) can gain prolongation of life?
18. What is your opinion as to the average gain in months from PD (as a component of any multimodality therapy)?
19. Do you believe that debulking (alone or as a component of any multimodality therapy) can gain prolongation of life?
20. What is your opinion as to the average gain in months from debulking (alone or as a component of any multimodality therapy)?
21. Do you believe that the operation of EPP itself can improve breathing?
22. Do you believe that the operation of EPP (as a component of any multimodality therapy) can improve breathing?
23. Do you believe that the operation of PD itself can improve breathing?
24. Do you believe that the operation of PD (as a component of any multimodality therapy) can improve breathing?
25. Do you believe that debulking can improve breathing?
26. Would all your answers apply equally to sarcomatoid mesothelioma?
27. Do you believe that cure is a possibility in sarcomatoid mesothelioma?
28. In your opinion can life be extended by surgery in sarcomatoid mesothelioma?
29. In your opinion can radical surgery gain useful palliation in sarcomatoid mesothelioma?
30. Do you perform EPP?
31. How many times in 2008 did you perform EPP?
32. Do you perform PD?
33. How many times in 2008 did you perform PD?
34. Do you perform debulking operations through thoracotomy?
35. How many times in 2008 did you perform debulking operations through thoracotomy?
36. Do you perform debulking operations by videothoracoscopy/VATS?
37. How many times in 2008 did you perform debulking operations by videothoracoscopy/VATS?
38. Are you a member of EACTS?
39. Are you a member of ESTS?
40. Are you a member of AATS?
41. Are you a member of STS?
42. Type of practice
43. Level of practice
44. Years in independent practice
45. Age
46. Country of practice
47. Country of practice: other (please specify)
48. Continent
49. Hospital size. Number of beds?
50. Unit size. Number of beds?

EPP, extrapleural pneumonectomy; MPM, malignant pleural mesothelioma; PD, pleurectomy/decortication; EACTS, European Association for Cardio-Thoracic Surgery; ESTS, European Society of Thoracic Surgeons; STS, Society of Thoracic Surgeons; VATS, video-assisted thoracic surgery; AATS, American Association for Thoracic Surgery.

period was 111 days for ESTS, 99 for EACTS and 75 for STS. During this time period two reminders were sent to EACTS and STS members and one to ESTS members in order to boost responses.

An iterative exploration of the results was performed and a selection of analyses is presented here. The full data set is available for further research on application to EACTS Thoracic Domain.

## 2. Response

We received a total of 802 responses. For individual questions the number of complete responses ranged from 688 to 802. There were 235 responses from ESTS members repre-

senting about a quarter of the membership. There were 341 responses from EACTS members and 348 from STS members but as both have a preponderance of cardiac surgeons, most of whom did not see it as appropriate to respond, we cannot be sure of the appropriate denominator and therefore cannot supply a response rate overall. In all 122/802 respondents belonged to more than one professional organisation.

We asked that members of more than one organisation replied only once but we could not exclude the possibility of double voting without breaking the promised anonymity. There was no evident difference in opinions and beliefs according to organisation so any form of exclusion or adjustment would not have been warranted.

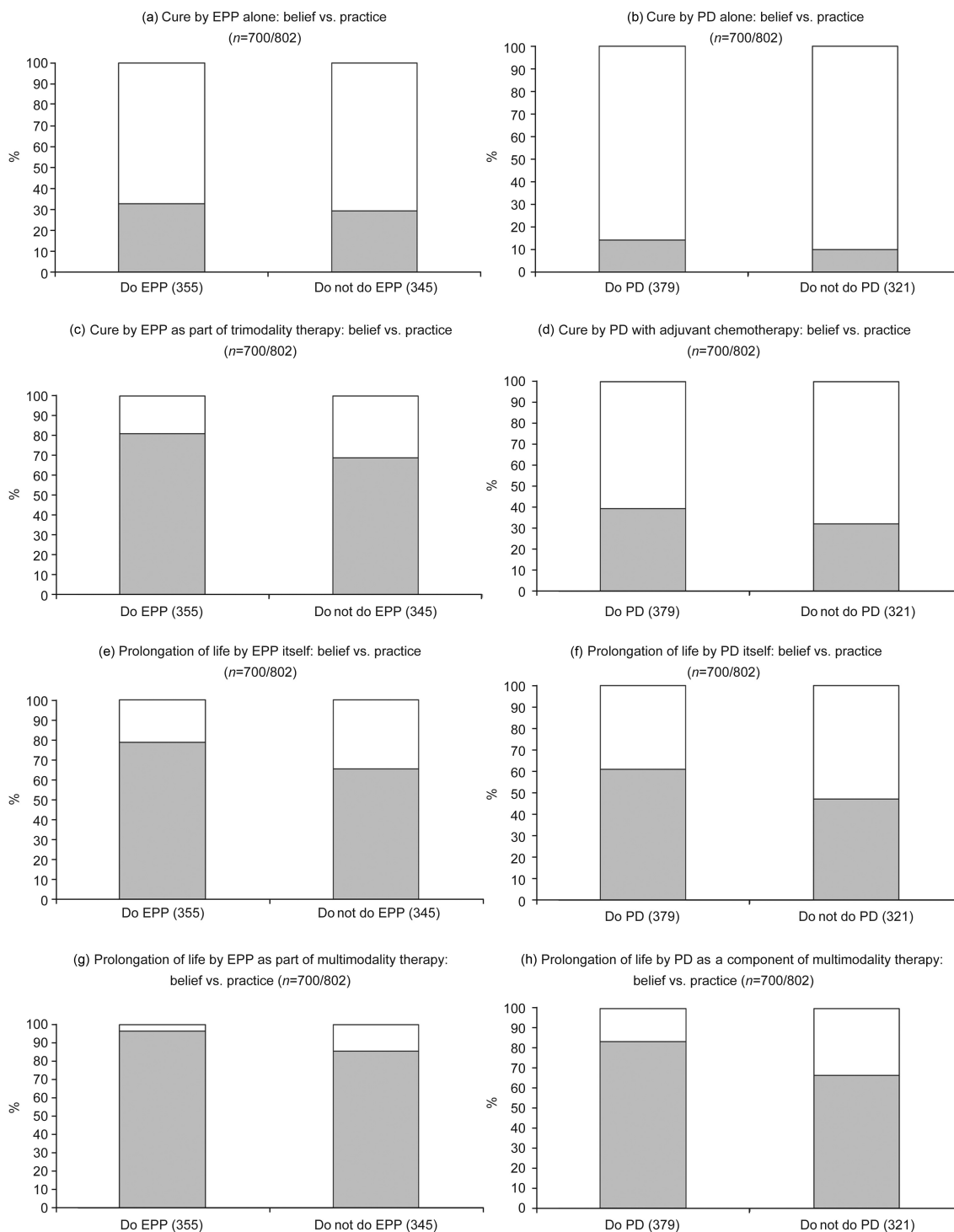


Fig. 1. The left hand column of four barcharts are all related extrapleural pneumonectomy (EPP), the right are equivalent questions for pleurectomy/decortication (PD). The top row concerns cure with surgery alone (Q. 1&3) and the second surgery combined with the maximum appropriate adjuvant therapies (Q. 9&7). The next two rows concern prolongation of life with surgery alone (Q.11&15) and with maximum adjuvant therapy (Q. 13&17). For each question the responses are shown for those who do and do not perform EPP and PD (Q. 30&32). Higher rates of cure and prolongation of life are believed with EPP than PD, with adjuvant therapy than without, and for some questions, by those who do rather than those who do not perform the surgery.

Fig. 1(a-h) presents the answers to eight questions in pairs for EPP and PD. These questions ask whether the responder believes that the operation can achieve cure of epithelioid mesothelioma and whether it can achieve prolongation of life, by the effect of the operation alone, and

with adjuvant therapy thus providing  $2 \times 2 \times 2 = 8$  panels in the Figure. The responses in each panel are divided into those who do and do not perform the operation. There is a very evident pattern. For both cure and prolongation of life, more surgeons believe it is achievable with EPP than

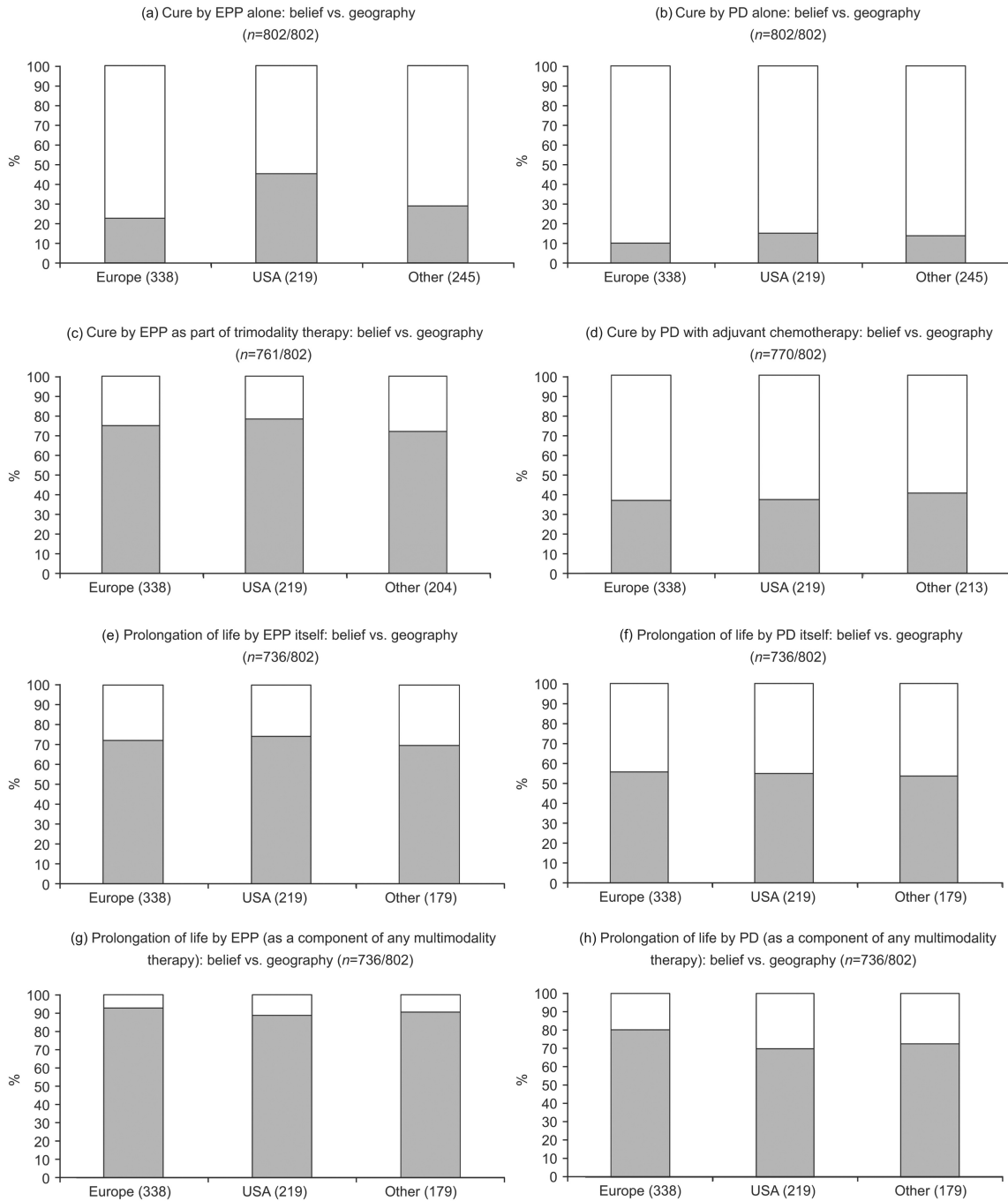


Fig. 2. The questions are the same as those in Fig. 1 for each of the eight panels with the difference that the effect of the geographical location of the surgeon (Qs. 46, 47, 48) is explored.

with PD, it is more likely with adjuvant therapy than without, and these beliefs are a little more frequently held, but not markedly so, by those who do than do not perform that surgery.

Fig. 2(a–h) takes the same questions and explores if there is any difference in these responses from Europe, USA and other parts of the world. Forty-five percent of responders from the USA believed that EPP alone could cure epithelioid mesothelioma compared with 23% in Europe. This was the

largest difference we found for any of the comparisons made (Fig. 2a). There was little evident difference in belief according to type of practice, or seniority for the majority of questions.

Fig. 3(a–f) show the practice setting, the seniority of the respondent, and the years in practice. There is no striking pattern.

Fig. 3g shows opinions as to the cure rate of epithelioid mesothelioma. The cure rate is believed to be greater with

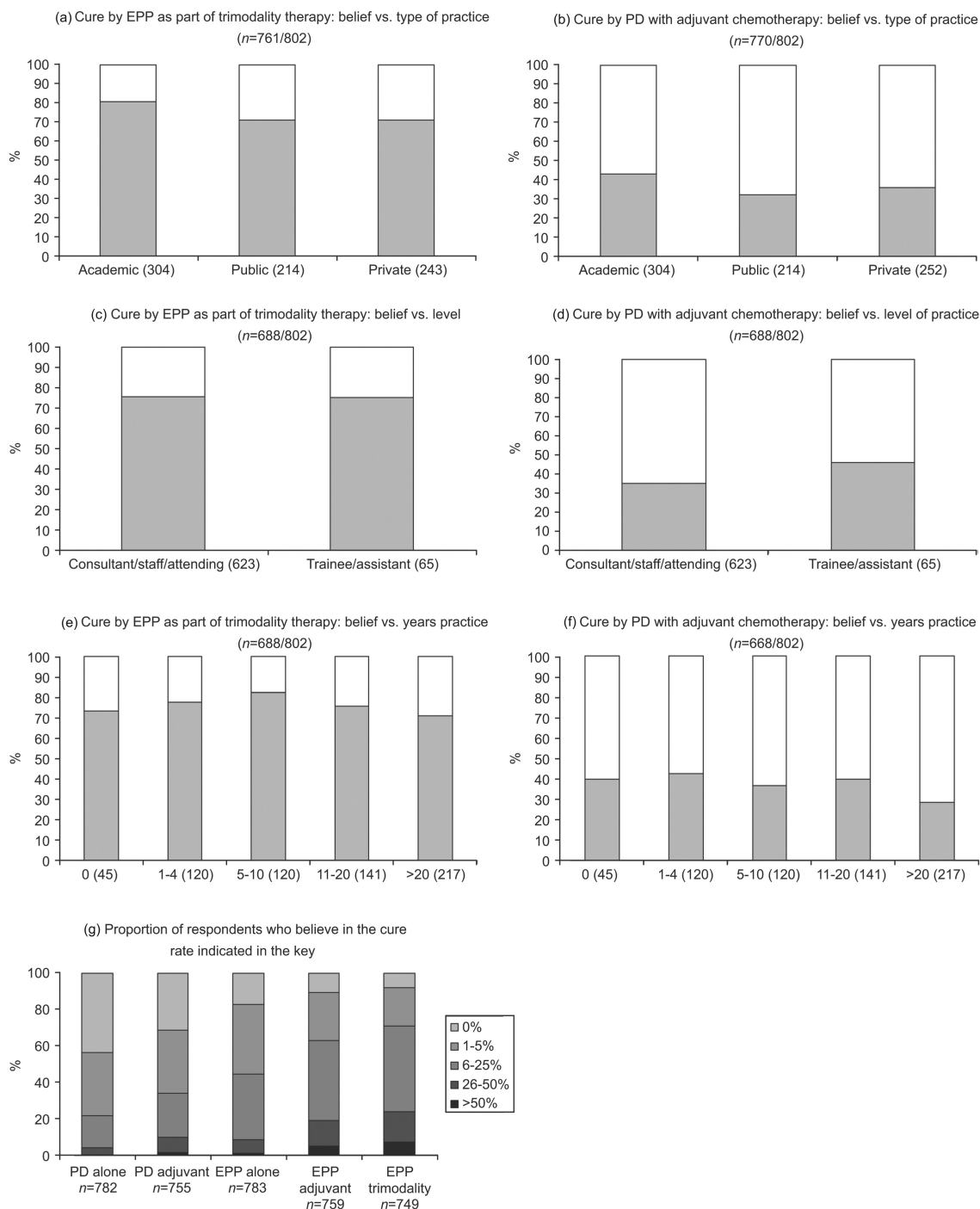


Fig. 3. For EPP and PD, each combined with the highest level of adjuvant therapy available (Q. 9&7), the effect of the practice setting (Q. 42), seniority (Q. 43) and years in practice (Q. 44) are explored. There is no consistent effect observed. In the final chart beliefs in cure rates for EPP and PD alone and with adjuvant therapy are displayed (Q. 4, 8, 2, 6, 10). The questions have been ordered according to increasing numbers believing in higher cure rates. EPP is believed to cure more often than PD and increasing intensity of adjuvant therapy is believed to increase the cure rate within each operation. EPP, extrapleural pneumonectomy; PD, pleurectomy/decortication.

EPP than PD and, for each operation, to rise with the addition of adjuvant treatment and is believed highest when EPP is part of trimodality therapy.

There were the questions where respondents showed a large measure of agreement (that is to say > 90% share the opinion). For example the belief that EPP within multimodality therapy prolongs life (Fig. 1g) is shared by 91% (637/

700) while only 12% (86/700) believe that PD alone can achieve cure (Fig. 1b). But for many questions respondents were relatively evenly divided, commonly with splits of the order of 70:30.

Note that we offer no tests of statistical significance. With 50 questions, and their subdivision, the number of 2x2 comparisons is vast. With the number of results

available, to select those of interest for a statistical test of inference and to claim significance or not, would be entirely inappropriate.

### 3. Conclusion and comments

The six surgical authors of the report had the opportunity to present their personal beliefs within the survey and so here we report impartially the beliefs of this very large sample of thoracic surgeons. The objective was not to set a knowledge quiz and the survey should not be viewed as such. We therefore make no attempt to test these opinions and beliefs against ‘evidence’. Nor do we see any purpose in any form of adjudication on the reasonableness or otherwise of any of these beliefs but individual surgeons may be interested in where their own views sit amongst those of 800 of their peers.

The quality of evidence with respect to the effectiveness of mesothelioma surgery is recognised as poor, relying as it does on retrospective clinical reports [7]. The available published guidance has therefore largely been derived by consensus. A North American guideline from the National Comprehensive Cancer Network advocates EPP in selected cases<sup>1</sup> but recent European guidance is rather to the contrary suggesting that EPP should be performed only within clinical trials. It will be seen that this difference in North American and European guidance with respect to EPP is reflected in the most obvious geographical difference in the survey (Fig. 2a). Both guidelines suggest a place for more conservative, lung sparing approaches with complete resection of visible disease by surgery, commonly named PD.

The incidence of MPM continues to rise in many countries and thoracic surgeons will have a role in its management. We sought to discover the opinions and beliefs of the many thoracic surgeons involved in the care of these patients in Europe, North America and throughout the world. A total of 802 surgeons responded. EPP was believed to be more

effective than PD and the addition of adjuvant chemotherapy and multimodality therapy were believed to increase the chance of cure. These beliefs were not markedly different between those who performed or did not perform each form of surgery. Opinions varied little with type of practice. There was one geographical difference, however, American surgeons are twice as likely to believe that EPP alone can cure mesothelioma as those in Europe (45% vs. 23%).

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<sup>1</sup> National Comprehensive Cancer Network. Malignant Pleural Mesothelioma. 2010. NCCN Clinical Practice Guidelines in Oncology. [www.nccn.org](http://www.nccn.org).