

# PTSD in South African anaesthetists after experiencing a death on the theatre table

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**Background:** A death on the table affects the anaesthetist emotionally and can lead to anxiety, depression, substance abuse and post-traumatic stress disorder (PTSD). Management strategies such as debriefings are not applied regularly. We determined the prevalence of probable PTSD after a death on the table, whether anaesthetists were debriefed and if they had time off after the event.

**Methods:** A quantitative observational, cross-sectional study with convenience sampling using an online questionnaire was conducted. The impact of events scale-revised was used to measure the likelihood of PTSD. Demographic data, qualifications, years of experience and data regarding debriefings after the event were also collected. The study population comprised anaesthetists registered with the South African Society of Anaesthesiologists (SASA) who experienced a death on the table.

**Results:** Of 1 859 potential participants who were contacted, 453 responded (24.4% response rate). The final analysis included 375 completed questionnaires, with 108 (28.8%) respondents having a probable diagnosis of PTSD. Age, experience, level of qualification and workplace did not affect the likelihood of developing PTSD. Only 15.5% of the respondents were debriefed. Of those with probable PTSD, 92.6% would have wanted debriefing, 85.2% would have liked time off and 82.4% felt the event influenced their work decisions. Corresponding figures in respondents without PTSD were 77.9%, 61.0% and 67.0%, respectively.

**Conclusion:** The prevalence of probable PTSD following a death on the table was high and debriefings were rarely done. We recommend the development of workplace protocols to facilitate emotional wellbeing.

**Keywords:** post-traumatic stress disorder, PTSD, emotional impact, patient death, anaesthetist

## Introduction

The dictum "first do no harm" is taught to physicians from the early stages of their career. Anaesthetists are responsible for the patient in every aspect of physical, physiological and psychological wellbeing.<sup>1,2</sup> Thus, following a death on the table, the anaesthetist may feel responsible and experience a range of professional, personal and interpersonal emotions.<sup>3,4</sup>

In developed countries, perioperative deaths due to anaesthetic complications alone are rare (one in 13 000), while perioperative deaths in general are more common (one in 500).<sup>5</sup> Developing countries have a two to four time increased risk of anaesthesia related and perioperative mortality compared to developed countries.<sup>6</sup> Perioperative deaths and anaesthesia-related deaths in South Africa are classified under the superordinate *procedure-related deaths*. The act includes deaths related to procedures not requiring anaesthesia.<sup>7</sup> A total of 1 732 deaths were reported as procedure-related in South Africa (SA) in 2015; it is not been stated how many of these occurred intraoperatively.<sup>8</sup> Therefore, it is difficult to establish exactly how many anaesthetic-related deaths occur in South Africa. However, if these 1 732 procedure-related deaths are taken into account, it is prudent to argue that most South African anaesthetists will experience at least one death on the table during their career.

Research in developed countries have shown that 62–92% of anaesthetists witnessed at least one intraoperative death during his/her career.<sup>4,9</sup> Although doctors are confronted with death

more often than the average person, it remains a traumatic event.<sup>10</sup> Certain factors play a role in how an intraoperative death is perceived by the attending anaesthetist and surgeon. For instance, an anaesthetist would probably be affected more by an "unexpected" death of a young healthy patient classified as ASA 1 by the American Society of Anesthesiologists physical classification, than an "expected" death of a polytrauma ASA 5E patient having emergency surgery.<sup>4</sup> Literature regarding a possible difference in perception between an expected and unexpected death on the table is scarce. In a Canadian study,<sup>11</sup> 64% of anaesthetists experienced an unanticipated perioperative death, and although only 11% of the deaths were anaesthesia-related, 25% of anaesthetists felt that they were being blamed for the death.<sup>11</sup> Other aspects that cause considerable stress are the experience or lack of experience of the healthcare provider, fear of litigation and the reclusive nature of the work, especially in the private sector, as public health providers are not directly liable and a consultant anaesthetist is usually available for advice, and therefore the responsibility is shared.<sup>9</sup>

Following a traumatic event, an individual can develop an array of psychological disorders, such as post-traumatic stress disorder, depression, anxiety, and substance abuse. The most prevalent of these conditions is post-traumatic stress disorder (PTSD).<sup>12</sup> PTSD leads to an increase in suicidal behaviour, interpersonal problems, decreased income, and mental and physical health issues.<sup>13</sup> Certain recommendations have been made to mitigate the situation, such as immediate debriefing, collegial support and whether or not the anaesthetist and surgeon should be allowed

to continue with the theatre list.<sup>9,14-16</sup> Although immediate debriefing is regarded as a beneficial intervention, it remains a rare occurrence, leaving the affected anaesthetist vulnerable to negative emotional responses.<sup>17-19</sup>

Anaesthetists agree that time off after such an event should be offered. The amount of time off that is acceptable varies from one to two days, while some feel that a case-by-case approach should be followed.<sup>3-5</sup> However, in a resource- and staff-constrained setting, such as within the South African healthcare services, the likelihood of getting time off after an intraoperative death is probably slim. This is probably true for private and government sectors, although for different reasons: the private sector because of the fast pace of the work, and government sector due to staff shortages. No specific research that compares the two sectors in this regard has been conducted, and therefore this line of reasoning is purely speculative. Guidelines for dealing with a death on the table focus more on the medico-legal aspects or how to communicate and deal with the patient's family, than mitigating the emotional impact on the anaesthetist.<sup>16</sup> This approach could possibly alleviate the emotional impact to some extent, but the focus of the intervention is not on the anaesthetist.

The primary objective of the study was to determine the emotional impact of a death on the table on the anaesthetist by determining the prevalence of PTSD after such an event. The impact of events scale-revised (IES-R)<sup>20,21</sup> was used to determine the likelihood of PTSD. Secondary objectives were to determine whether anaesthetists were debriefed, had time off or had confidence issues after the event. Because of the diversity of debriefings offered, and because it was not our primary objective, we did not evaluate the type of debriefings offered. We asked the participants whether they would have wanted time off after such an event, although we did not determine how the time off would be spent.

## Methods

A quantitative observational study with a cross-sectional design was conducted. Most anaesthetists and registrar anaesthetists in South Africa are members of the South African Society of Anaesthesiologists (SASA). The SASA membership database was used to recruit participants by means of convenience sampling. A link to an online questionnaire to be completed anonymously and an informed consent form was emailed to all specialist and registrar anaesthetists registered with SASA in 2018. Only anaesthetists registered with SASA who have experienced a death on the table were included in the study analysis. The recruitment period spanned three months, from May 2018 to July 2018, and multiple reminders were sent to improve the response rate. Data was collected via the Research Electronic Data Capture (REDCap) system,<sup>22</sup> which is managed by Safe Surgery South Africa (SSSA).<sup>23</sup> The data collected consisted of the following components:

- Demographic information: gender, age, years of experience, qualifications, workplace.

- The watershed question: Have you ever experienced a death on the table? If they answered yes, the participants were requested to complete the following two components as well.
- Debriefing information: did the anaesthetist receive a debriefing; would they have liked a debriefing; did they get time off; how much time off do they think is needed; did it influence their decision making.
- The IES-R: a 22-question screening tool for PTSD.

When completing the IES-R, the participants scored each question in terms of how it affected him/her. A score of 0 means the participant was not affected at all and a score of 4 means that the death affected the participant in an extreme manner. The score of all 22 questions is then summated, which gives an indication of the probability of the participant to be diagnosed with PTSD. The 22 questions measure avoidance, intrusion and hyperarousal symptoms which are indicative of the diagnosis of PTSD.<sup>20</sup> If a participant achieved a total of 33 or higher, he/she is considered to have a probable diagnosis of PTSD. Previous studies have shown that scores of more than 33 can be used with specificity (0.91) and sensitivity (0.82) when screening for PTSD. It has been suggested in large studies, that where a structured clinical interview is not possible, the IES-R can be used to identify people with PTSD.<sup>21,24</sup> An electronic link to the SASA Wellness team flowchart with contact numbers was provided at the end of the questionnaire, should the participants feel distressed after answering the questionnaire.

The data were captured electronically, exported to an Excel spreadsheet and sent to the University of the Free State Department of Biostatistics for analysis. Descriptive statistics, namely frequencies and percentages for categorical data, and medians and percentiles for numerical data, were calculated. We calculated the prevalence of PTSD and its 95% confidence interval (CI). For categorical data, associations between age, years of experience and PTSD were calculated and described by means of chi-square, or Fisher's exact tests when the sample size was too small. For numerical data, the Kruskal-Wallis test was performed. *P* values  $\leq 0.05$  were considered statistically significant.

## Results

A total of 1 859 emails were sent to anaesthetists registered with SASA, of which 453 responses were received (24.4% response rate). Sixty-one respondents' questionnaires were discarded due to incomplete, missing and nonsensical data. Of the remaining 392 respondents, 375 (95.7%) had experienced a death on the table, allowing the inclusion of these respondents in the study (Figure 1).

Table 1 shows the participants' demographic information. The median age was 43 years, with an interquartile range (IQR) of 36–57 years. More males than females ( $n = 216$ , [57.6%] and  $n = 159$  [42.4%], respectively) formed part of the study.

The median years of experience was 15 years (IQR 8–27 years). Most of the participants had at least a postgraduate diploma in anaesthesia ( $n = 229$ ; 61.1%), followed by a Fellowship ( $n = 210$ ; 56.0%) and a MMed degree ( $n = 159$ ; 42.4%) in anaesthesiology. The difference between Fellowship and MMed numbers could

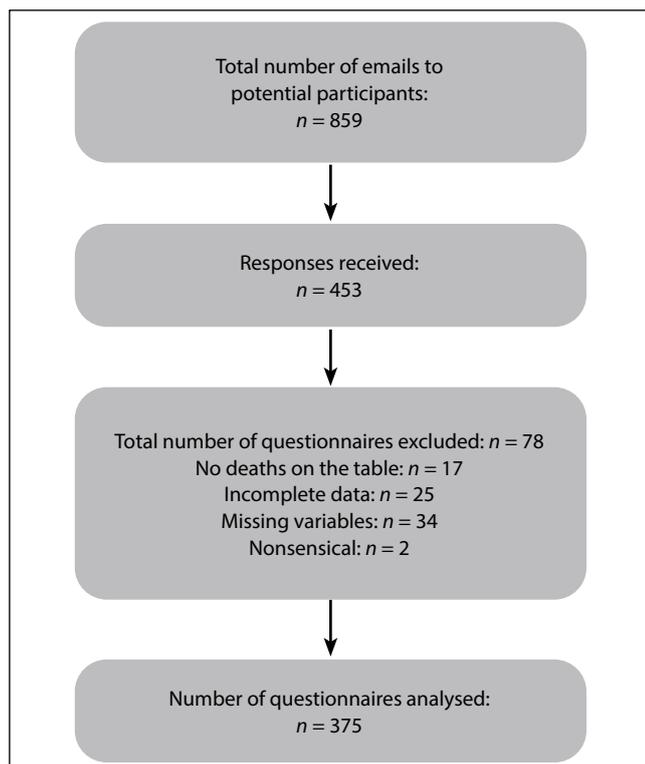


Figure 1

probably be attributed to the fact that until 2012, registrars at Afrikaans universities completed a MMed only. Private practitioners accounted for 54.7% ( $n = 205$ ) of participants. Practitioners were either in solo practice ( $n = 95$ ; 25.3%) or part of a group practice ( $n = 110$ ; 29.3%) One hundred and fourteen (30.4%) participants were employed by the public health sector on a full-time basis.

A total of 108 (28.8%; 95% CI 24.4–33.6%) participants obtained a score of  $\geq 33$  on the IES-R and therefore had a probable diagnosis of PTSD. No statistically significant difference was observed between the demographic data of the participants with PTSD and those without PTSD, as shown in Table II.

Table III shows that in the PTSD group, only 28.7% ( $n = 31$ ) of participants had a departmental protocol in place to deal with a death on the theatre table, compared to 41.6% in the non-PTSD group. Very few participants in both groups were debriefed (less than 16%), although statistically significantly more participants with PTSD wanted debriefing ( $n = 101$ ; 93.5%) than those without PTSD ( $n = 209$ ; 78.3%). Most participants continued with the theatre list after the event, with no statistically significant difference between the groups. However, more participants with PTSD ( $n = 92$ ; 85.2%) wanted time off than those without PTSD ( $n = 164$ ; 61.4%). The amount of time that participants felt should be given off was similar between the two groups, with most participants indicating that the rest of the day off or a decision on a case-by-case basis should suffice. Statistically significantly more anaesthetists in the PTSD ( $n = 89$ ; 82.4%) group felt that the death on the table influenced their decision making compared to the group without PTSD ( $n = 178$ ; 66.7%).

Table I: Demographic information of the sample group of anaesthetists ( $n = 375$ )

Variable	n (%)
<b>Gender</b>	
Male	216 (57.6)
Female	159 (42.4)
<b>Postgraduate qualifications (more than one option possible)</b>	
Diploma in Anaesthesia	229 (61.1)
FCA(SA)*	210 (56.0)
MMed in Anaesthesia	159 (42.4)
PhD in Anaesthesia	9 (24.0)
Certificate in Critical Care	7 (1.8)
None	11 (29.3)
Other such as BSc, Dip Pec, FRCA	32 (8.5)
<b>Workplace</b>	
Private practice solo	95 (25.3)
Private practice as part of an association or partnership	110 (29.3)
Public health sector (government)	114 (30.4)
Joint public sector and private practice	49 (13.1)
Other, such as retired, research, locum	7 (1.9)

\*FCA(SA) – Fellowship of the College of Anaesthetists of South Africa

## Discussion

Most anaesthetists in South Africa will be confronted by a death on the theatre table during their careers. In our study, 96% of the respondents experienced this traumatic event. This correlates with a UK-based study where 92% of respondents reported having experienced a death on the table.<sup>25</sup>

The emotional wellbeing of doctors, specifically anaesthesiologists, has been receiving more attention in recent years as the importance thereof is starting to be recognised.<sup>26,27</sup> Adverse events in anaesthesia are fairly common.<sup>28</sup> However, few are as traumatising as experiencing your patient's demise while under your care. Studies have found that a patient's death has an adverse effect on 31–57% of doctors who had cared for the deceased patient.<sup>9,25,29,30</sup>

The general population has a prevalence of PTSD of 3% following a traumatic event.<sup>9</sup> This study found that the prevalence of probable PTSD among South African anaesthetists after a death on the table is approximately 10 times higher at 28.7%. Clearly this topic deserves more attention than it has in the past to identify anaesthesiologists who have a particular high risk of PTSD.

Although we anticipated that the years of experience and age of the practitioner would contribute to the impact of a death on the table on the practitioner, we found that age, gender, years of experience, workplace and qualification did not differ significantly between the practitioners with probable PTSD and those without. Gazoni et al.<sup>9</sup> reported that, despite only 15% of respondents in their study being trainees, no correlation was noted between the emotional impact and experience of the anaesthetist.<sup>9</sup> We believe that further research is needed that

**Table II:** Comparison of the demographic characteristics of participants with and without probable PTSD

Variable	PTSD (n = 108)		No PTSD (n = 267)		Statistical test	P-value
	n (%)		n (%)			
<b>Gender</b>						
Male	58 (53.7)	158 (59.2)	Chi-square	0.33		
Female	50 (46.3)	109 (40.8)				
<b>Age (years)</b>						
28–34	22 (20.4)	52 (19.5)	Chi-square	0.7		
35–44	40 (37.0)	91 (34.1)				
45–54	18 (16.7)	44 (16.5)				
55–65	16 (14.8)	58 (21.7)				
66–74	9 (8.3)	18 (6.7)				
≥ 75	3 (2.8)	4 (1.5)				
<b>Years of experience</b>						
1	1 (0.9)	0 (0)	Fisher's exact test	0.32		
2–4	2 (1.8)	11 (4.1)				
4–7	23 (21.3)	43 (16.1)				
8–15	33 (30.6)	90 (33.7)				
> 15	49 (45.4)	121 (45.3)				
<b>Postgraduate qualifications</b>						
Diploma in Anaesthesia	73 (67.6)	156 (58.4)	Chi-square	0.1		
FCA(SA)#	58 (53.7)	152 (56.9)	Chi-square	0.57		
MMed in Anaesthesia	52 (48.1)	107 (40.1)	Chi-square	0.15		
PhD in Anaesthesia	0 (0)	9 (3.4)	Fisher's exact test	0.06		
Certificate in Critical Care	2 (1.9)	5 (1.9)	Fisher's exact test	1.00		
None	2 (1.9)	9 (3.4)	Fisher's exact test	0.74		
Other	7 (6.5)	25 (9.4)	Chi-square	0.37		
<b>Workplace</b>						
Private practice solo	34 (31.5)	61 (22.8)	Chi-square	0.5		
Private group practice	27 (25.0)	83 (31.1)				
Public health sector (government)	32 (29.6)	82 (30.7)				
Joint public and private sector	13 (12.0)	36 (13.5)				
Other	2 (1.9)	5 (1.9)				

#FCA(SA) – Fellowship of the College of Anaesthetists of South Africa

**Table III:** Post-event procedures among participants with and without probable PTSD

	PTSD (n = 108)		No PTSD (n = 267)		Statistical test	P-value
	n (%)		n (%)			
Departmental protocol in place	31 (28.7)	111 (41.6)	Chi-square	0.0004*	0.02*	
Debriefing received	17 (15.7)	41 (15.4)			0.92	
Debriefing wanted	101 (93.5)	209 (78.3)				
Continued with theatre list	83 (76.9)	196 (73.4)				
Would have liked time off	92 (85.2)	164 (61.4)			< 0.0001*	
<b>Amount of time off#</b>						
Rest of the day	39 (42.4)	74 (45.1)	Fisher's exact test	0.93		
One day	10 (10.9)	15 (9.2)				
One week	1 (1.1)	1 (0.6)				
Decide on case-by-case basis	42 (45.7)	74 (45.1)				
Event influenced decision making	89 (82.4)	178 (66.7)	Chi-square	0.002*		

\*Statistically significant difference, #Applicable to participants who would have liked time off

focuses on the contribution of emotional exhaustion to PTSD in young trainee anaesthetists, where emotional exhaustion is highest.<sup>31</sup>

The risk of developing PTSD after a traumatic event can be mitigated by taking time for a comprehensive debriefing afterwards.<sup>16-18</sup> We recommend two phases of debriefing: defusing followed by critical incident stress debriefing (CISD).<sup>32</sup> Defusing is a peer-led open group discussion and should be done within hours after the event, whereas CISD should be performed by a trained facilitator within 10 days of the incident. It should be noted, however, that CISD is not therapy and is mainly used to identify individuals that will need further assistance.

In this study, we could not assess if debriefing significantly reduces the incidence of probable PTSD compared to those participants without PTSD. However, the number of debriefings provided was very low in both groups and approximately 94% of the participants who developed probable PTSD expressed a need for debriefing. Furthermore, as many as 78% of respondents without PTSD also felt they needed a debriefing. This finding was in keeping with an American study where 89% of respondents who experienced a critical event felt that debriefing should have been provided.

In training facilities, it is the responsibility of the anaesthesiology department to ensure that debriefings are done. Unfortunately, for example in a study among Australian trainee anaesthetists, this does not happen routinely. In this study, approximately 50% of the trainees were of the opinion that they did not have departmental support.<sup>18</sup> Less than half of the respondents in our study had a departmental protocol in place. However, if such a protocol were in place, anaesthetists may have been less likely to develop PTSD. Private practitioners in South Africa are usually not part of an academic department and would therefore not receive the support of a department of anaesthesia.

We recommend the appointment of a designated person to coordinate debriefings. Additionally, an experienced colleague in the field of anaesthesia should be assigned to the affected anaesthetist as a mentor to provide support for as long as required. Simulation-based training is ideal as these coping skills are difficult to teach in a real situation. Candidates who participated in these simulations found them useful.<sup>33,34</sup>

Another factor that can mitigate the risk of developing PTSD could be to relieve the relevant anaesthetist from clinical duties for some time to reflect on the event and recover from the emotional trauma. This is important, not only for the wellbeing of the anaesthetist, but also to prevent possible substandard care for the patients who follow. It is not surprising that the literature reports compromised patient care within the first four hours following a traumatic event.<sup>9,25</sup> In a qualitative South African study, it was noted that most interviewees were concerned about their subsequent functioning in theatre.<sup>3</sup> An American national survey showed that 51% of respondents felt that their ability to administer anaesthesia was compromised immediately following the event.<sup>9</sup>

In this study, participants with probable PTSD showed an increased need for time off after the event compared to those without PTSD. The need for this 'time off' would likely depend on the specific event, whether it was an expected or an unexpected death, or if the anaesthetist felt responsible for the death or not.<sup>11,25</sup> The temperament of the anaesthetist involved would also affect if he/she would require time off, which was not assessed in this study. During a session on wellness at the 2019 SASA national congress, some anaesthetists felt that "getting back on the horse" is the best course of action. Others felt that the anaesthetist should not be allowed to continue the list, and that the affected anaesthetist should not be sent home alone and should attend a debriefing or be offered a counselling session during the time off. In practice, however, time-off might be challenging, especially for the solo practitioner and in resource-constrained environments. Even in developed countries, 87-93% of anaesthetists continued with the surgical list despite most guidelines recommending discontinuation.<sup>9,22</sup>

### Study limitations

We used the SASA database to recruit participants, therefore medical officers and general practitioners who provide anaesthesia were not included, which could have introduced selection bias. The study was limited by the fact that only the prevalence of probable PTSD was measured. None of the other effects (anxiety, depression, and substance abuse disorder) of a traumatic event was recorded, and therefore the emotional impact might have been underestimated. The IES-R is only a screening tool and a definitive diagnosis of PTSD cannot be made exclusively on the results of this questionnaire. The IES-R should usually be conducted within seven days of the traumatic event. However, this approach might not have yielded a sufficient number of participants for the study, and also because of the fact that PTSD has been shown to develop up to 10 years after a traumatic event, we decided not to enforce the proposed time constraint. Volunteer bias is also a factor that should be taken in to consideration, as convenience sampling was used and an individual who was adversely affected by a death on the table might be more inclined to participate than someone who did not experience a death on the table. Additionally, participants who were not affected adversely, may not have participated.

Another limitation of the study is that the participants were questioned on their collective experience a death or deaths on the table. As the experience could differ depending on the circumstances, it could have given some insight into whether an expected or unexpected death affected the anaesthetist a greater or lesser degree. Participants who had experienced more than one death on the table probably chose the most traumatic event, but it cannot be concluded with absolute certainty.

The study had a response rate of 24.4%, which was comparable with most online surveys, although we would have preferred it to be higher, the margin of error for a population of 1 859 and a 95% confidence interval is 5%, suggesting a satisfactory return for our study.<sup>35,36</sup> Through the online platform, we could reach a large number of anaesthetists from different environments all over South Africa, which was lacking in the study by Jithoo et al.<sup>3</sup>

## Conclusion

This study found a high prevalence (28.8%) of probable PTSD among South African anaesthetists who have experienced a death on the table during a surgical procedure. No risk factors for the development of PTSD could be identified. Limited debriefings are currently performed, hence we appeal to departments of anaesthesiology, associations and hospitals to have a protocol in place to assist the anaesthetist who has experienced a death on the table. It is advised that the anaesthetist should not continue with clinical duties immediately after the event and that his/her emotional wellbeing be closely monitored. As anaesthetists, we should be aware of the impact that a death on the table has on ourselves and our colleagues, and we need to play an active part in mitigating the adverse effects of such an incident.

Further research opportunities are available as there remains depression, anxiety, and substance abuse disorder to be investigated after a death on the table. One might also implement a proper program on debriefing after such an event and then repeat the survey to determine if the intervention has made a meaningful difference.

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## Conflict of interest

The authors declare that they have no conflicts of interest.

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## Ethical approval

Ethics approval was obtained from the Health Sciences Research Ethics Committee of the University of the Free State (Ref: UFS-HSD2018/0129/2404). Permission to conduct the research was also obtained from SASA.

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### Annexure: Biographic information

You have been asked to participate in a research study. Please note that by completing this questionnaire you are voluntarily agreeing to participate in this research study. You will remain anonymous and your data will be treated confidentially at all times. You may withdraw from this study at any given moment during the completion of the questionnaire. The results of the study may be published.

**1. Indicate your gender.**

Male  Female

**2. What is your age? \_\_\_\_\_**

**3. How many years of experience do you have in anaesthesia? \_\_\_\_\_**

**4. What post-graduate qualifications do you have?**

Diploma in Anaesthesia	<input type="checkbox"/>	MMED in Anaesthesia	<input type="checkbox"/>
FCA(SA)	<input type="checkbox"/>	PhD anaesthesia	<input type="checkbox"/>
Certificate in critical care	<input type="checkbox"/>	None	<input type="checkbox"/>

Other: \_\_\_\_\_

**5. Where do you work?**

Private practice – solo	<input type="checkbox"/>	Private practice as part of association or partnership	<input type="checkbox"/>
Government sector	<input type="checkbox"/>	Government and private practice	<input type="checkbox"/>

Other \_\_\_\_\_

**6. Have you ever experienced a death on the theatre table during your years of experience as an anaesthesiologist?**

Yes  No

**IF YOU ANSWERED "NO" TO THE QUESTION 6, PLEASE DO NOT CONTINUE WITH THE QUESTIONNAIRE. THANK YOU FOR YOUR TIME.**

**7. Did the department in which you worked at the time of the event have a protocol in place indicating the procedures to follow after a death on the theatre table?**

Yes  No

**8. Did you receive any debriefing or trauma counselling after the event?**

Yes  No

**9. Would you have liked debriefing after the event?**

Yes  No

**10. Did you carry on with the theatre list immediately after the event?**

Yes  No

**11. Would you have liked to have had time off following the event?**

Yes  No

**12. If yes, how long would you consider adequate?**

The rest of the day	<input type="checkbox"/>	1 Day	<input type="checkbox"/>
1 Week	<input type="checkbox"/>	Decide on case-by-case basis	<input type="checkbox"/>

**13. Did the event have an influence on your decision making as an anaesthesiologist?**

Yes  No