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Emergency Conditions in Horses: Opinions and Decision Making of Livery Yard Owners

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ABSTRACT

Objective: The aim of this study was to evaluate equine livery yard owners' opinions of emergency conditions, and to identify factors influencing emergency decision making in the horse.

Background: There is limited data on horse owners' opinions and decision making in emergency conditions.

Evidentiary value: An online questionnaire was distributed to UK livery yard owners accredited with the British Horse Society. There were 104 survey participants, who represented experienced owners with responsibility for care of a number of horses.

Methods: The questionnaire consisted of open and closed questions on participants' demographics, their experiences and opinions of the most common equine emergency conditions, and emergency decision making. Descriptive data analysis included frequency ranking and categorisation of free text responses.

Results: The majority of respondents had kept horses for more than 10 years (97%), and reported previous experience of emergency conditions (99%), predominantly colic (96%) and wounds (92%). Participants considered that the most common emergency conditions were colic (98%), wounds (49%) and fractures (22%), and the most concerning conditions were colic (94%), lameness (36%) and wounds (21%). Factors believed to be important in emergency decision making were: degree of pain, likelihood of condition resolving, and severity of disease.

Conclusion: This study highlights the importance of colic and wounds as emergency conditions in the horse, and describes factors considered important in emergency decision making.

Application: The outcomes identify where research and clinical resources should be targeted to improve emergency care for horses. The results were used to inform a survey of the wider horse population.

INTRODUCTION

The horse owner plays a crucial role in the maintenance of their animals' health and welfare, however there are limited studies published about owners' opinions or experiences of equine disease conditions (Ireland et al., 2011; Ireland et al., 2013). The majority of studies focus on common conditions in horses, and data for emergency conditions are lacking. There is a single study of veterinary practitioners' opinions of commonly encountered emergency conditions, conducted in the US in 1991 (Traub-Dargatz et al., 1991). This study was a survey of veterinary practitioners' opinions of common medical problems, conducted by the American Association of Equine Practitioners. It provides a useful snapshot of veterinary practitioners experiences and opinions, but there is currently no data from horse owners about the types of emergencies they experience.

The owner's opinion of the importance of a disease will depend both on how common it is, and the impact it has. Both these factors may affect owners' approach to diseases and their decision-making around cases. Identifying conditions which are common and concerning to livery yard owners will help recognise which areas or conditions may require further investigation to ascertain where

education and resources may be most beneficial. This is particularly important for emergency conditions where horse owners may have limited access to resources to inform decision-making, and may have to make major decisions under financial, time and emotional pressures.

The aim of this study was to survey the opinions of experienced horse owners on the most common diseases and emergency conditions in the horse, and identify factors that influence their decision making in emergency situations.
The objectives of the study were:

- To conduct an online survey of livery yard owners' opinions on the most common and concerning disease conditions in horses
- To assess livery yard owners' experiences of emergency conditions and their opinion on the most common emergency diseases
- To identify factors that influence livery yard owners' decisions in emergency situations.

METHODS & MATERIALS

Ethics
The study was reviewed and approved by the School of Veterinary Medicine and Science Ethics Committee, University of Nottingham.

Study Design
A cross-sectional study design was employed via an online survey, which was developed and distributed to livery yard owners.
The target population was experienced horse owners. The rationale for this selection was to negate the differences in ability, knowledge and experience in the general horse owner population with the aim of getting a better understanding of the common and important conditions. The sampling frame used was owners of livery yards approved by The British Horse Society (BHS) as this was an accessible population that was easily contactable within the limits of data protection. BHS approved yards are yards within the UK, Ireland and worldwide which have applied for and met predefined approval criteria (http://www.bhs.org.uk/professionals/become-bhs-approved/approved-livery-yards). There were 503 BHS approved livery yard owners listed with contact details on the BHS website at the time of the study (accessed 05/12/2013). Livery yard owners were emailed a cover letter and link to the online survey on 01/01/2014. A reminder email was sent to all those who had not completed the questionnaire 2 weeks later, at which time non-participants were asked if they would provide a reason for not wishing to participate.

Survey Design
The survey consisted of open and closed questions on livery yard owners' opinions of the veterinary conditions in four main sections: participants' opinion of conditions requiring veterinary attention and emergency decision making, participants' experiences of emergency situations, participants' demographics and equine experience, and where participants sought advice on equine health. The individual questions and their specific formats are listed in Table 1.

Section			Question	Type of question
A	Veterinary conditions	1	There are many reasons veterinary surgeons are called out to horses. What do you think are the most common reasons a horse requires veterinary care (not including routine treatments such as vaccinations and dental care)?	Open question (three free text boxes).
		2	There are also a number of critical conditions which may require emergency treatment by the veterinary surgeon. What do you think are the 3 most common CRITICAL (life threatening) conditions that veterinary surgeons are called to horses for?	Open question (three free text boxes).
		3	Which three veterinary conditions are the most concerning to you as a horse owner?	Open question (three free text boxes).
		4	If your horse was in a CRITICAL (life threatening) condition, which factors would most influence your decision making with regards to whether you were going to treat a horse or euthanise it. Please rank these in order, with 1 being the most likely to influence your decision making.	Ranking question of nine provided answers: • Financial cost of veterinary care and treatment • Whether the horse was insured for that specific condition • The likelihood the condition was to resolve with treatment • The amount of pain/suffering the horse was experiencing • How sick the horse was at the time of treatment • Age of the horse • Any other problems/illnesses that the horse may have already • Whether the horse could recover enough to be

				used for breeding • Whether the horse would recover enough to return to its previous level of work
		5	Are there any other factors that would influence your decision making? If so, please mention them briefly below.	Open question (free text response).
B	Emergency situations	1	Have you ever had to call a veterinary surgeon in an emergency?	Closed question.
		2	If you answered YES to B1(they have had to call a veterinary surgeon in an emergency), please complete the rest of this page. If you answered NO, please skip to page 4. What have been the condition(s) that have affected your horse(s) in the situations when you have called the veterinary surgeon in an emergency? Please tick all that apply	Closed question. A comprehensive answer list was formed using an adapted human critical care Systematized Nomenclature of Medicine (SNOMED) system (Supplementary item 1)
		3	In the emergency situations mentioned above, do you feel the veterinary surgeon was called out soon enough?	Closed question.
		4	If you answered NO to the previous question, please briefly comment on why you do not think the veterinary surgeon was called out soon enough.	Open question (free text response).
		5	How easy do you find it knowing the right time to call the veterinary surgeon?	Closed question.
		6	When you have had to call a veterinary surgeon in an emergency situation previously, how traumatic have you found the experience as a horse owner?	Closed question.
		7	If you would like to comment further on your experiences of emergency situations, please use the box below.	Open question (free text response).
C	Owners' demographic information	1	What age category do you belong to?	Closed question.
		2	Are you male or female?	Closed question.
		3	How long have you kept horses for?	Closed question.
		4	How many horses do you have responsibility of care for at the moment?	Closed question.
		5	What is the management of the horses on your yard?	Closed question.
		6	Who cares for the horses on your yard most of the time?	Closed question (multiple option response).

		7	Do you have any equine qualifications? (BHS, pony club, veterinary nursing, college course, degree etc.)	Closed question.
		8	How would you rate your level of experience with regards to horse care?	Closed question.
		9	What discipline are the horses in your care predominantly used for?	Closed question.
		10	At what level do the horses in your care compete at?	Closed question.
D	Owners' advice seeking behaviour	1	Where would you usually seek advice from with regards to your horse's health? Please tick all that apply.	Closed question: • Friends/family • Yard owner • Trainer • Veterinary surgeon • Physiotherapist • Farrier • Other (please specify)
		2	Please comment on who you would seek advice from in the first instance.	Closed question.

Table 1: Content and format of questions used in an online survey of UK livery yard owners' opinions and experiences of common and emergency conditions in horses.

The first section related to participants' opinions of common veterinary conditions, common critical/life threatening conditions and which conditions they were most concerned about The survey included one ranking question about factors influencing decision making in emergency situations. The closed response options were formulated using the results of a study that investigated horse owner decision making in horses suffering from abdominal pain (Scantlebury et al., 2014).
The second section related to emergency situations, and asked participants about their experience of different emergency conditions in the horse, their confidence in their decision to call a veterinary surgeon in an emergency, and their experiences of decision making in these situations.
The third section contained questions on the owners' demographics, whilst the final section related to owners' advice seeking behavior. Free text boxes were provided at the end of each section for any further comments, and there was a feedback section at the end of the questionnaire.

The questionnaire was initially drafted in a Microsoft Word (2013) document, and then transferred into the cloud based internet survey tool Survey Monkey, California.

The survey was pretested by three equine researchers and piloted with 15 horse owners, before the final amended version was distributed. The survey remained open for a total of 23 days (01/01/2014 to 24/01/2014).

Data Analysis
Data from the online survey tool was transferred to a Microsoft Excel (2013) spreadsheet for data handling and analysis. Data were checked and cleaned with incomplete questionnaires (where only the consent section were completed) removed prior to analysis. A standardised weighting was calculated to quantify factors affecting decision making with a higher weighting attributed to a higher ranking. This enabled identification of the factors that most affected decision making in the study population.
Data were subject to descriptive analysis, including calculation of the mean, median and range for continuous variables, and percentage frequencies for categorical variables. Free text responses were categorised and the frequency of different themes was identified.
As not all respondents answered all questions, denominators for each question are given where required.

RESULTS

Participants
Of the 503 possible contacts identified, there were 450 valid email addresses available. There were 133 livery yard owners who consented to participate; 104 participants fully completed the survey, giving a response rate of 30% and a completion rate of 23% (Figure 1).

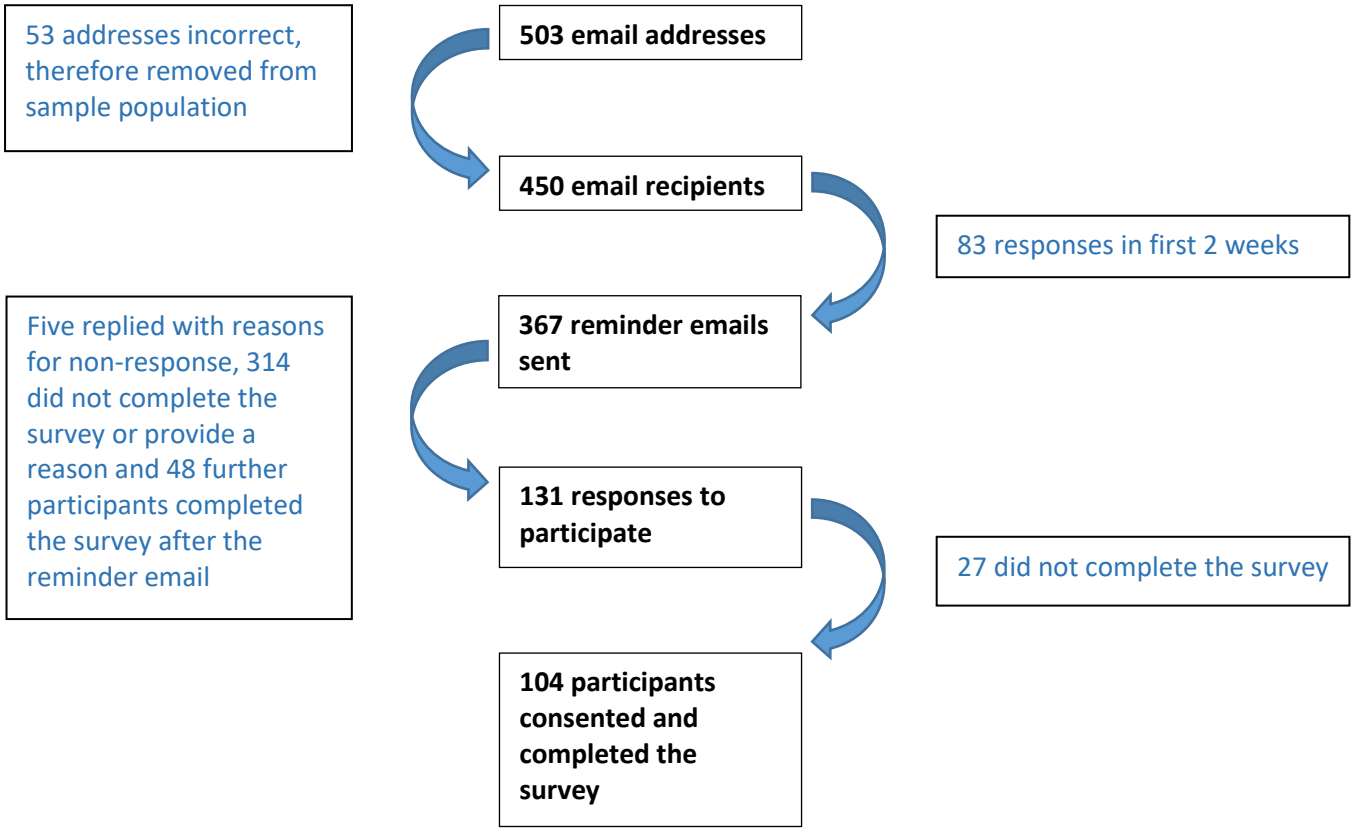

Figure 1: Recruitment of yard owners to participate in a questionnaire about common conditions in horses using a list of British Horse Society (BHS) approved livery yards.

There were 32% of participants aged between 45 to 54 years old, 25% were 55 to 64 years old, 24% were 35 to 44 years old, 11% were 25 to 34 years old and 8% were 65 years old or over whilst no participants were under 24 years old. Females accounted for 89% (n=91/102) of participants. The majority (97%; n=97/100) of respondents had kept horses for more than 10 years, whilst 58% (n=58/100), had kept horses for more than 30 years. The number of horses that yard owners had responsibility of care for varied considerably, although the majority had more than 20 horses in their care. 33% of respondents (n=33/101) had more than 40 horses, 19% (19/101) had 30–39, 16% (16/101) had 25–29, and 12% (12/101) had 20–24 horses in their care.

Most of the livery yard owners' had mixed management strategies on their premises. Full livery (yard staff delivering the daily care) was provided by 46% (n=46/99) of yards, whilst 'do-it-yourself' livery (owner centred daily care of the horses) was offered by 39% (n=39/99). The majority of horses kept on livery yard owners premises' (reported by 74% of yard owners; n=64/87) were used for general purpose activities. Qualifications held by livery yard owners' varied from none (16%; n=17/104) to equine undergraduate degrees (8%; n=8/104). The majority of participants (65%; n=68/104) held formal equine qualifications from the British Horse Society (BHS). The vast majority of participants (95%; n=97/102) felt they were experienced in horse care.

Livery yard owners' experiences and decision making with equine veterinary problems
The most commonly identified conditions that required veterinary visits were reported in free text format. These were reviewed and retrospectively categorised into main disease types. The most common problems were colic (84%; n=87/104), lameness (75%; n=78/104), wounds (54%; n=56/104) and 'injury' (16%; n=17/104). A further 28 common conditions were identified, but these were each mentioned by less than 5% of participants (Supplementary Item 2).

The most commonly identified critical conditions requiring emergency attention were categorised as colic (98%; n=101/103), wounds (49%; n=50/103), fractures (22%; n=23/103), 'serious injury' (15%; n=15/103), choke (12%; n=12/103), laminitis (12%; n=12/103) and grass sickness (10%; n=10/103). There were a further 21 critical conditions mentioned, all of which were mentioned by less than 10% of participants (Supplementary Item 2).

The conditions of most concern to respondents were categorised into colic (93%; n=92/99), lameness (35%; n=35/99), wounds (21%; n=21/99), 'serious injuries' (17%; n=17/99), laminitis (16%; n=16/99), fractures (15%; n=15/99), strangles (15%; n=15/99) and infectious diseases (12%; n=12/99). A further 23 conditions were mentioned by less than 10% of participants (Supplementary Item 2).

Yard owners were asked to rank the factors that would most influence their decision making with regards to choosing treatment or euthanasia when a horse was critically ill. The factors most commonly nominated were: the amount of pain and suffering the horse was experiencing, the likelihood that the condition would resolve with treatment, how sick the horse was, financial cost of treatment, and age of the horse (Figure 2). In addition, 43% of participants chose to use the free text box associated with this question. The main themes identified from the comments were: multifactorial decision making, veterinary advice, sentimentality and length of ownership of the horse, and whether the horse would have to travel for treatment. Additionally, concerns were raised about length of recovery and whether the horse's temperament would lend itself to the recovery process. Other influencing factors mentioned were how "useful" the horse was to the business and, previous experience including outcomes of a condition.

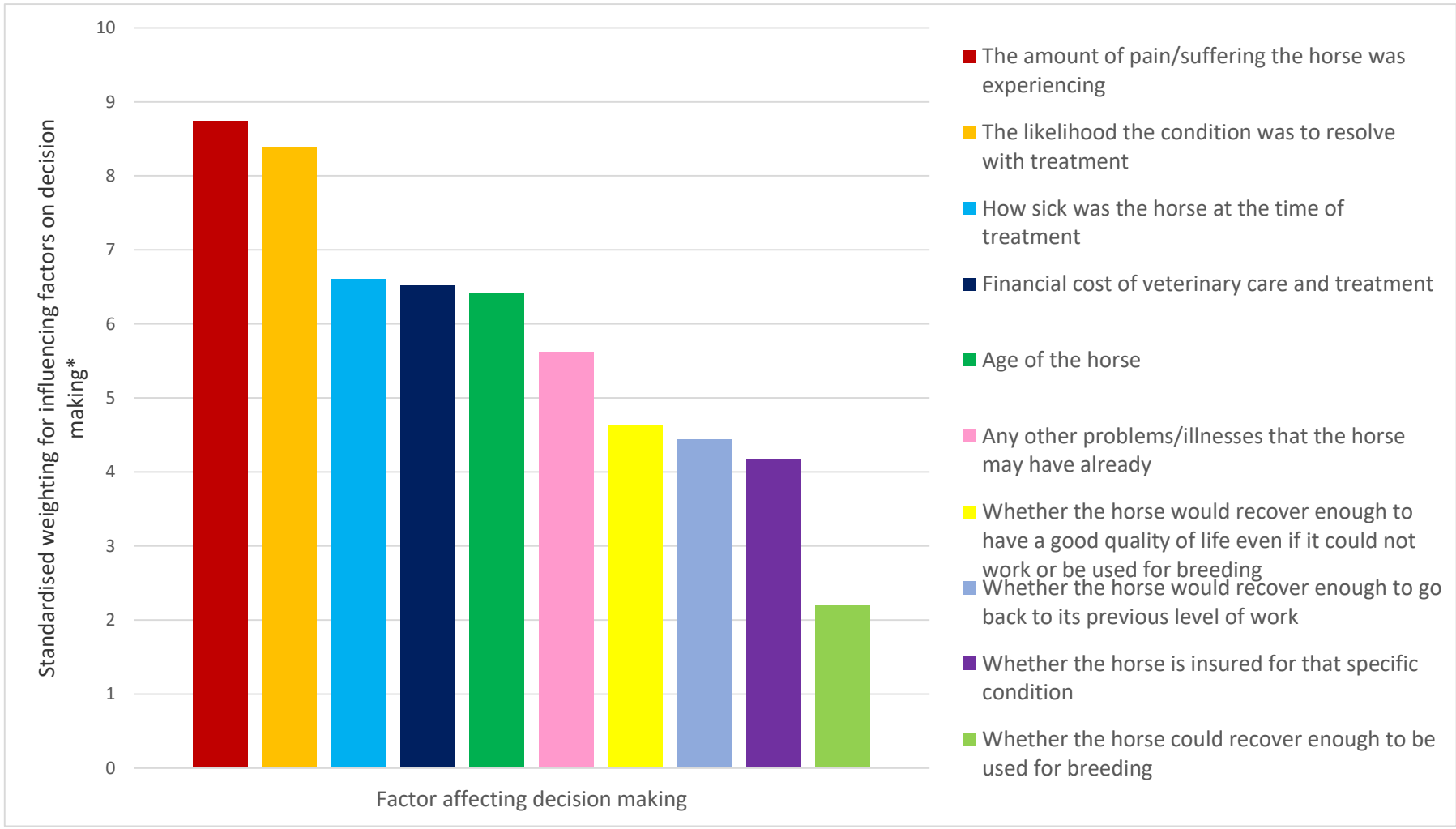

Figure 2: Standardised weightings of different factors affecting livery yard owner decision making (n=104) in critical situations as reported in an online survey of livery yard owners about common conditions in horses. *The factor affecting decision making was ranked by participants from a closed list.

Factors ranked as more important were given a higher weighting, therefore a higher standardised weighting is equivalent to a greater influence on decision making.

Livery yard owners experience and decision making with equine emergency conditions

103 participants (99%) responded that they had previous experience of emergency conditions (a veterinary surgeon had visited their horse as a result of a condition that they considered to be an emergency). Those without personal experience were not required to complete the emergency experiences section. There were 38 separate conditions that had been experienced by participants (Table 2). The most frequently experienced conditions were colic (96%; n=99/103), wounds (92%; n=95/103), laminitis (66%; n=68/103), choke (59%; n=61/103) and foot abscesses (57%; n=59/103).

Condition experienced	% of respondents	No. of respondents
Colic	96%	99
Wound	92%	95
Laminitis	66%	68
Choke	59%	61
Foot abscess	57%	59
Foot penetration	49%	50
Joint/ bursal infection/ penetration	48%	49
Acute respiratory distress	48%	49
Fracture with no evident wound	47%	48
Uveitis	42%	43
Lymphangitis	41%	42
Tendon rupture/ laceration	40%	41
Rhabdomyolysis	40%	41
Fracture with open wound	39%	40
Strangles	38%	39
Cellulitis	32%	33
Ligament rupture/ laceration	31%	32
Collapsed horse	27%	28
Neuropathy	21%	22
Severe haemorrhage (not from nose)	21%	22
Ataxia	18%	19
Cardiac conditions	17%	18
Grass sickness	17%	18
Joint luxation/ dislocation	16%	16
Seizures	16%	16
Eye penetration	16%	16
Epistaxis	15%	15
Poisoning	13%	13
Melting ulcers	13%	13
Problems whilst foaling	11%	11
Problems after foaling	11%	11
Systemic Inflammatory Response Syndrome/Septicaemia (SIRS)	10%	10
Neonatal conditions	9%	9
Post castration bleeding/ infection	9%	9
Other myopathies	8%	8
Urological conditions	8%	8
Gestational problems	8%	8
Notifiable diseases	3%	3

Table 2. Livery yard owners' experiences of emergency conditions in the horse (n=103 respondents) as reported in an online survey.

The majority (96%; n=99/103) of respondents believed that during their experiences, the veterinary surgeon had always been called out to see an emergency soon enough. Those participants who had experienced a delay in veterinary treatment (n=4/103) described this as either due to themselves (the yard owner) or the veterinary surgeon. Yard owner factors included: waiting to observe a horse, not realising the extent of injury, an inability to contact the individual horse owners, and not having permission to act on their behalf. The circumstances of delays in veterinary surgeons attending were due to attendance at other emergencies at the time of the call, or a large distance to travel. Most livery yard owners (95%; n=98/103) considered that they did not find it difficult knowing the correct time to call a veterinary surgeon. Whilst 37% (n=38/103) of the study population felt emergency visits were traumatic in nature, 44% (n=45/103) had no strong opinion on whether the experience(s) were traumatic or not.

There were 24 participants (23%) who made free text comments regarding the traumatic nature of emergencies. These were grouped into three main categories which related to the veterinary surgeon, the horse and the yard owner. Factors that increased the trauma related to the veterinary surgeon, were delays in attendance, unfamiliar veterinary surgeons, and a delay in performing euthanasia of the horse. Factors that increased the trauma related to the horse were when the horse was distressed, when the horse had suffered a fracture, or when euthanasia was required. Factors relating to the yard owner were the financial implication of referral, more specifically having/finding a deposit for immediate treatment. Other comments included: yard owners experiencing a delayed reaction, emergencies becoming less traumatic with experience, and coping with emergencies being part of a yard owners' occupation.

Advice seeking behaviour

The most frequent sources of advice were respondents' veterinary surgeons (99%; n=100/101), farriers (77%; n=78/101) and physiotherapists (42%; n=42/101). Other sources of advice were friends and family, trainers, paraprofessionals, yard staff and the internet. When asked who they would seek advice from first, 24% (n=23/94) of participants would always go to a veterinary surgeon, whilst a further 67% (n=63/94) stated they would seek advice from a farrier for foot related problems, and a veterinary surgeon for any other condition.

DISCUSSION

This is the first study to investigate common and important conditions for livery yard owners, and evaluate their experience of equine emergencies. The survey highlighted the importance of colic amongst the livery yard owner population. It was considered to be the most common reason for veterinary attendance (excluding vaccination and routine dental care), as well as being a cause of concern for 94% of the study population. Furthermore, it was the condition that was reportedly experienced by the greatest number of survey participants, reflecting the perception that it was also the most common emergency condition.

The survey was developed to capture opinions about common and emergency conditions from an experienced population of horse owners. This introduced a selection bias to the results and thus they are not likely to be representative of the general horse owner population as many demographics of horse owner were excluded from the study. The number of premises' appearing on the British Horse Society's approved yards list at the time of distribution was 503, but some did not have valid contact details. The response rate was 30%. This response rate is consistent with other online surveys. The results of the survey may not be representative of the horse owning population, however, a specific sampling frame was used to evaluate responses from

experienced horse owners/carers with responsibility for a number of different types of horse, and therefore was appropriate to the aim of the study. The target population were assumed likely to be computer literate, given that email addresses were available in the public domain, and therefore the use of an online platform was considered appropriate. The main drop out from the survey was immediately after the consent slide (22%) making it possible that potential participants were deterred by the type of questions, the length of the survey, or the requirement for consent. The demographics questions were placed later in the survey structure to try to engage participants in the study topic early and reduce drop out.
The demographics of the study population were similar to other owner focused studies in the literature (Scantlebury et al., 2011; Scantlebury et al., 2014; Murray et al., 2015; Slater, 2017) with an even spread of ages and a strong female bias to the study population.

The findings of the questions about common, non-emergency conditions in this study were in contrast to other studies reporting on common conditions in horses. Other studies of common conditions have identified musculoskeletal conditions, specifically lameness, as the most frequent reason for veterinary attendance (Loomans et al., 2007; Ireland et al., 2013; Nielsen et al., 2014; Slater, 2017). The differences are possibly due to the different data collection methods, including whether the studies looked at incidence or prevalence, the categorisation of diseases (whether they are grouped into systems or individual conditions) and whether the data was captured from veterinary practitioners or horse owners. The National Equine Health Survey and the study by Ireland et al. (2013), aimed to gain a snapshot of the conditions horses were experiencing at a particular time point, which would be more likely to identify chronic conditions. Colic tends to be a short duration disease whereas episodes of lameness can be prolonged or permanently present in some horses. This current survey may also be subject to recall bias, as colic and other emergency conditions may be more memorable and traumatic for owners, therefore they believe they are generally more common. When considering emergency conditions specifically, colic was identified as the most common in previous studies, although these have focused on referral hospital populations (Traub-Dargatz et al., 1991; Southwood et al., 2009; Viljoen et al., 2009). In the United Kingdom, there is only one study, which reported on veterinary opinions of common conditions seen in first opinion practice. This did not relate to emergency conditions specifically, but gastrointestinal disease was the second most common complaint nominated by veterinary surgeons after musculoskeletal disease (Nielsen et al., 2014).

There are very few studies that look at decision making in equine critical cases, and most of these relate to veterinary decision making (Archer, 2004; Freeman and Issaoui, 2013). Scantlebury et al. (2014) focused on owner decision making in equine colic specifically. It reported that different typologies of horse owner made different decisions; the results from the current study of livery yard owners therefore may not be applicable to the general horse owning population. Furthermore, their decision making was not referenced to their own horse or 'horses in their care' (which was undefined and therefore open to participant interpretation). Some livery yard owners may have given responses relating to their own horses, and others about clients' horses which they cared for; these factors should be considered as a potential source of bias in the responses as the two standpoints represent different typologies of horse owner.

The majority of participants had sought veterinary attention for emergency situations, and therefore it was surprising that over 50% of the study population had only experienced five different conditions (colic, wounds, laminitis, choke and foot abscesses), and recall bias may again be a factor influencing this. Nearly a third of participants found emergency situations traumatic. Most participants felt they knew when they required attendance of a veterinary surgeon in emergency situations, but this survey reflects opinion and is not necessarily what actually happens. The majority of participants' had formal equine qualifications and therefore had received some formal training on equine health and disease. It is reassuring that the majority of participants stated that they would phone a veterinary surgeon directly for advice, and would readily use this source if they were concerned. It would be interesting to explore further the knowledge and understanding of certain emergency conditions of the general horse owning population, and how this potentially impacts on the horses in these yard situations.

This study clearly identified the importance of colic to livery yard owners, both in terms of frequency and impact: it was identified as both the most common emergency and nonroutine condition, and as the disease that was most concerning for participants. There were a number of factors involved in emergency decision making, including the severity of the disease, the prognosis, financial considerations, and individual horse factors (including age, use of the animal and any concurrent conditions). This study highlighted concerns and opinions of experienced equine livery yard owners'; future work should focus on the wider horse owning populations' in knowledge and experience of colic.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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