

# Factors associated with rehoming and time until rehoming for horses listed with an equine charity

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## Abstract

The number of unwanted horses in the UK has increased in recent years. It is therefore important to identify factors that indicate whether a horse can be rehomed and how long it takes to be rehomed. Data from 1 January 2013 until 30 March 2014 were extracted from an equine rehoming charity's database. Exposure variables were examined using multivariable logistic and Cox regression. In total, 791 horses were included in the study and 410 (51.8%) were rehomed during the study period. Median time until rehomed was 39 days (IQR 24–75). Horses whose owner was prepared to transfer ownership were nearly three times more likely to be rehomed than those available for loan. Horses deemed suitable for beginner riders had higher odds of finding a new home, compared with those needing an advanced rider. Horses that were only suitable as unriden companions took longer to find a new home than rideable horses. A restricted rehoming radius (<50 miles) also resulted in longer time to rehoming. Findings from this study can be used to inform rehoming strategies but also to identify horses less likely to be rehomed, and thus where alternative options should be considered.

## Introduction

The number of horses and ponies (hereafter referred to as 'horses') considered to be unwanted or no longer useful by their owners has risen considerably in the last 10 years in the UK,<sup>1,2</sup> representing a serious welfare issue.<sup>3,4</sup> Owners who, for whatever reason, no longer wish to, or can, keep their horse can choose to sell or rehome it. Alternatively, horses can be relinquished to an equine charity or similar organisation for temporary or permanent care, be sent to slaughter or euthanised.<sup>1,2,5</sup> Due to the growing size of the problem, charities that rescue or take in unwanted horses in the UK are nearing, or have exceeded, critical capacity.<sup>3</sup>

Horses can become unwanted due to horse-related and/or owner-related factors.<sup>6</sup> Reasons for owners

seeking to rehome horses may include lack of money or time, poor health or owner death, and/or a change in family circumstances.<sup>7</sup> Horse characteristics that may result in them being unwanted could include health issues, old age, unsuitability for its intended purpose or undesirable behaviours.

In 2013, a UK-based equine rehoming charity (hereafter referred to as 'the charity') was established that aims to match horses available for rehoming to prospective adopters through a robust, custom-designed searchable website. The charity uses a rigorous applicant screening process. Horse owners wishing to rehome their animal via the charity are required to complete a comprehensive online form providing honest and detailed information about their horse and the circumstances that led to the decision to rehome. New horse listings are then screened by the charity (and additional information sought where required) prior to being made publicly available, to ensure that the animal is deemed suitable for rehoming. Horses are not surrendered to the charity and while homes are being sought for listed horses, they remain under the care of their current owner. The cost of the rehoming service is covered by a donation and application fees paid to the charity by potential adopters. All horses available for rehoming through the charity are listed on the website. Prospective adopters must apply for horses through the website. While current owners are encouraged to visit

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potential new homes themselves to assess suitability, an optional 'home check' service is provided through collaborating equine charities nationwide.

In the UK, limited data exist regarding horses available for rehoming,<sup>3</sup> and to date, no studies have investigated the association between owner or horse factors and the likelihood of rehoming or the time until rehoming. Therefore, the main aim of this study was to evaluate factors that may influence whether a horse is rehomed and the time it takes to be rehomed. Specific objectives were to (1) describe the population of horses available for rehoming through the charity, (2) describe owner-reported reasons for a horse being available for rehoming, (3) determine factors associated with whether a horse was rehomed or not, and (4) identify factors that influenced the time for a horse to be rehomed.

## Materials and methods

### Study design, period and population

This was a retrospective cohort study of horses that were listed for rehoming through the charity between 1 January 2013 and 1 January 2014. The end of the follow-up period was 30 March 2014, after which horses were considered as not rehomed.

Sample size calculations indicated that information on between 142 and 425 horses in each group of rehomed and non-rehomed animals would be required to detect an OR of 2.0 or 1.5, respectively, assuming a 30% prevalence of exposure in the non-rehomed group, 80% power and a 5% significance level. Calculations for the survival analysis indicated that fewer animals were required in the exposed and unexposed groups to detect a HR of 1.5, varying between 68 and 109 per group assuming unexposed:exposed ratios of 1 and 4, respectively, 80% power and a 5% significance level<sup>8</sup> (<http://biostat.mc.vanderbilt.edu/wiki/Main/PowerSampleSize>).

The eligible study population consisted of the first listing of a horse on the charity's website within the study period. For horses with multiple listings during the study period (ie, horses that were rehomed unsuccessfully and then listed again for rehoming), only the first listing was included in the data set.

### Data collection

Data were downloaded from the charity's database in an anonymised format with users of the site providing consent for the information they provide to be used for research purposes upon registration. Owner-reported information regarding horses available for rehoming included demographic data, reason for rehoming, health issues, workload and suitable new home. This information is provided as part of the listing process, in response to closed, semi-closed and open questions. Closed (ie, tick box) answers included age, sex, height, workload and type of new home sought, and

semi-closed answers included reasons for rehoming the horse. Free-text answers were provided on current and previous health conditions, and any ridden problems the horse may have.

### Exposure variables

Exposure variables investigated comprised five broad categories: horse-level variables, desired new home variables, new rider-specific variables, owner-reported reasons for rehoming and current location (online supplementary table 1). Horse size was categorised as horse ( $\geq 148$  cm) or pony ( $< 148$  cm) and also as horse ( $\geq 155$  cm), cob ( $< 155$  cm and  $\geq 148$  cm) or pony ( $< 148$  cm). Sex was categorised as male or female. Rehoming types were defined as a permanent rehoming, where the ownership of the horse was transferred to the new owner; a permanent loan, where the responsibility of the horse was given to the new owner, but the ownership was not transferred; a temporary loan, where the responsibility of the horse was given to the new owner for a defined period of time; or a share, if the owner was looking for someone to share the day-to-day responsibilities associated with the horse. Rehoming type was further categorised as a binary variable (0=temporary rehoming, where no transfer of ownership took place; 1=permanent rehoming, where transfer of ownership occurred). Reasons for rehoming the horse were categorised as lack of time, lack of money, change in family circumstances, personal health problems, behavioural problems of the horse and 'other', where owners could provide other reasons not listed above (see online supplementary table S1). Previous health issues (categorised as present/absent) were defined as health conditions reported by the owner as being resolved and/or not requiring ongoing treatment or management.

### Outcome variables

Horses were recorded as not rehomed, rehomed through the charity, rehomed but not through the charity, died or euthanised. From these, two outcome variables were determined: (1) whether a horse was rehomed (regardless of whether this was through the charity or not), coded as a binary variable (0=not rehomed, 1=rehomed); and (2) the number of days until a horse was rehomed through the charity, henceforth called time until rehoming. For the second outcome, horses that were not rehomed at the end of the study period (30 March 2014) were censored. Only horses that were not rehomed or rehomed through the charity were included in the time to rehoming analysis since it was not possible to establish a date of rehoming for those that had found homes via other routes. Horses that had died were included in the descriptive statistics but not included in analysis involving either outcome, as their date of death was not known.

## Statistical analyses

Descriptive statistics were derived and continuous variables were summarised by their medians and IQRs for non-normally distributed data or means and SDs for normally distributed data. Categorical variables were described as counts, percentages and 95% CIs.

### Logistic regression analysis

Logistic regression was used to determine factors that were associated with horses being rehomed or not.<sup>9</sup> Exposure variables were screened using univariable logistic regression and those with a likelihood ratio test *p* value <0.25 were selected for inclusion in a multivariable model. A preliminary multivariable model was built using a manual backwards method of elimination in which variables were retained in the model if the likelihood ratio test *p* value was <0.05. During model building, variables were removed in order, from the largest to smallest *p* value determined during univariable screening. Biologically plausible two-way interaction terms between the main effects variables were considered for inclusion in the multivariable model. Model diagnostics were conducted using summary measures of the goodness-of-fit of the final model<sup>9</sup> and the receiver operating characteristic (ROC) curve.<sup>10</sup> The logistic regression diagnostics included the evaluation of standardised Pearson's residuals and leverage scores.<sup>11</sup>

### Time until rehoming survival models

Exposure variables were tested for their relationship with the time until rehoming, using univariable Cox proportional-hazards regression models.<sup>12</sup> Variables were selected for inclusion in a multivariable Cox proportional-hazards model if the likelihood ratio test *p* value in the univariable analyses was <0.25. The multivariable model was built using backwards stepwise selection. Variables were retained in the model if the likelihood-ratio test *p* value <0.05. Biologically plausible two-way interaction terms were considered in the multivariable model. The assumption of proportional hazards was examined both globally and for each explanatory variable using the methods described by Grambsch and Therneau<sup>13</sup> in both normal and log-normal scale for the final multivariable model. The assumptions were considered to be violated if *p* value <0.05 on either scale. The overall fit of the model was assessed using Cox-Snell residuals.<sup>11</sup> Influential observations and outliers were determined using the deviance residuals and score residuals for each observation plotted against time. Where present, influential or outlying observations were then checked for biological plausibility.

All statistical analyses were performed using Stata V.11.1 (StataCorp, College Station, Texas, USA).

## Results

### Description of the study population

In total, 792 horses were listed on the charity's website between 1 January 2013 and 1 January 2014. One horse

was listed and rehomed twice during this period by two separate owners, leaving 791 individual horse records in the study population.

A total of 410 (51.8%; 95% CI 48.2% to 55.3%) horses were rehomed between January 2013 and March 2014; 163 (39.8%; 95% CI 35.0% to 44.7%) of these through the charity and 247 (60.2%; 95% CI 55.3% to 65.0%) via other routes. Of the horses that were not rehomed (*n*=381), 36 (9.4%; 95% CI 6.7% to 12.8%) died and 345 (90.6%; 95% CI 87.2% to 93.3%) were still available for rehoming at the end of March 2014. The mean number of new listings per month was 65.9±SD 14.7 and the mean number of horses rehomed through the charity per month was 13.6±SD 4.1, at a median time of 39 days (IQR 24–75) since listing. The minimum time a horse was listed and then rehomed was 2 days and the maximum time was 197 days.

Of the animals available for rehoming, 333 (42.1%; 95% CI 38.6% to 45.6%) were female and 458 (57.9%; 95% CI 54.4% to 61.4%) male; their mean age was 12.5 years (SD 5.9), 283 (35.8%; 95% CI 32.4% to 39.2%) were ponies and 508 (64.2%; 95% CI 60.8% to 67.6%) were horses. Native breeds, Thoroughbreds, Partbreds and Warmbloods were the breed types available for rehoming in 25.0% (*n*=198; 95% CI 22.0% to 28.2%), 20.2% (*n*=160; 95% CI 17.5% to 23.2%), 15.4% (*n*=122; 95% CI 3.0% to 18.1%) and 13.2% (*n*=104; 95% CI 10.9% to 15.7%) of listings, respectively. Sports horses comprised 9.5% (*n*=75; 95% CI 7.5% to 11.7%) of the study population, cob types 8.6% (*n*=68; 95% CI 6.7% to 10.8%), and foreign and unknown breed types comprised 8.1% (*n*=64; 95% CI 6.3% to 10.2%) of listings.

Four owners did not provide information regarding the health of their horse. Previous health issues were reported for 25.0% of horses (*n*=197; 95% CI 22.0% to 28.2%). All owners indicated what level of work the horse was capable of, with 32.1% (*n*=254; 95% CI 28.9% to 35.5%) of horses available for competitive use, 34.5% (*n*=273; 95% CI 31.2% to 37.9%) either unbroken or unriden, 21.2% (*n*=168; 95% CI 18.4% to 24.3%) for non-competitive riding and 12.0% (*n*=95; 95% CI 9.8% to 14.5%) for light ridden work only; 14.5% (*n*=115; 95% CI 12.2% to 17.2%) horses were being rehomed as non-ridden companions.

### Reasons for horses being available for rehoming

Owner-reported reasons for rehoming are shown in [table 1](#). One reason for rehoming the horse was provided on 66.1% (*n*=509; 95% CI 62.6% to 69.4%) of listings, two on 24.3% (*n*=187; 95% CI 21.3% to 27.5%) and three or more on 9.6% (*n*=74; 95% CI 7.6% to 11.9%) of listings. The most commonly reported reason for rehoming a horse was lack of time (*n*=301; 39.1%; 95% CI 35.6% to 42.6%). Horse behaviour was cited as a reason for rehoming by 5.9% (*n*=46; 95% CI 4.4% to 7.9%) of owners, while 17.3% (*n*=133; 95% CI



**Table 1** Reasons provided by owners for horses being available for rehoming from an equine rehoming charity's database (data from 791\* horses available for rehoming between 1 January 2013 and 1 January 2014)

Reasons (n=770)	Number	Percentage† (95% CI)
Lack of time	301	39.1 (35.6 to 42.6)
Lack of money	190	24.7 (21.7 to 27.9)
Personal health issues	108	14.0 (11.6 to 16.7)
Change in family circumstances	195	25.3 (22.3 to 28.6)
Horse behaviour	46	5.9 (4.4 to 7.9)
Other reasons‡	308	40.0 (36.5 to 43.6)
Giving up, retiring, relocating, no rider	70	22.7 (18.2 to 27.8)
No grazing, livery or agistment available	34	11.1 (7.8 to 15.1)
Owner unsuitable	35	11.4 (8.0 to 15.4)
Horse unsuitable	48	15.6 (11.7 to 20.1)
Horse health	39	12.7 (9.1 to 16.9)
Horse size	46	14.9 (11.1 to 19.4)
Horse numbers	17	5.5 (3.2 to 8.7)
Other (miscellaneous)	43	14.0 (10.3 to 18.3)

\*21 owners did not provide a reason for the horse being available for rehoming.  
 †Multiple answers were allowed for the reasons for rehoming; therefore, totals do not add up to 100%.  
 ‡2 owners did not respond to what the other reasons for rehoming the horse were.

14.7% to 20.1%) stated other horse-related reasons for rehoming, including health issues, unsuitability and/or horse size.

### Factors associated with rehoming

Following univariable analysis, region, radius from the current owner's location, type of home sought, level of rider required, availability as a companion only, desired workload, vaccination status, and the necessity of a veterinary or home suitability check all met the inclusion criteria for consideration in the multivariable model (online supplementary table 2). The final multivariable model presenting factors associated with the rehoming of horses is shown in table 2. Horses being offered for a permanent rehome, where ownership was transferred, were nearly three and eight times more likely to be rehomed compared with those available for permanent loan or sharing, respectively. Compared with horses that required advanced riders, horses suitable for intermediate riders and beginners were, respectively, two and three times more likely to be rehomed. In the final model, the ROC was 0.66.

### Time until rehoming

The variables region, radius from current owner, the suggested donation amount, new home suitability

check, type of home, breed type, size, age and workload of the horse, dental and vaccination status, whether tack and rugs were provided with the horse, previous health condition, behaviour as a reason for rehoming or availability as a companion only were considered for inclusion in the final model (online supplementary table 3).

Region, radius from the current owner, breed type, age, whether the horse was available as a companion only and the donation amount were all retained in the final model (table 3). The hazard rate of rehoming was 67% lower for horses that were available as companions only, compared with horses without this restriction. Horses located in South England were rehomed at a 57% higher rate than those in mid England and those seeking a new home nationwide were rehomed three times quicker than those whose owner wished them to remain within a 50-mile radius of its current location. Horses >17 years and horses between 11 and 17 years old were, respectively, rehomed two and nearly three times more quickly than <5-year-olds. Those described as Sports horses were rehomed twice as quickly than native breeds. Horses for which the suggested donation amount was between £250 and £499 were rehomed two times quicker than horses with a donation amount of less than £100. Proportional hazards were not violated in either normal or log-normal scales, and no influential observations were detected.

### Discussion

This is the first study to describe horses available for rehoming in the UK and identify factors associated with the success and speed of rehoming. Findings seem to support the growing concern regarding unwanted horses in the UK,<sup>3 4</sup> as nearly half of all horses listed on the charity's website were not able to find new homes within the study period. For horses that were rehomed through the charity, most were rehomed within 75 days. The time it took to rehome a horse was influenced by horse-related factors; age, breed type and whether the horse was available as a companion only, as well as factors relating to the location of the current and potential new owner, and the donation to the charity requested. Whether a horse was rehomed was associated with different factors; these factors were

**Table 2** Multivariable logistic regression model of factors associated with rehoming for horses listed with an equine rehoming charity between 1 January 2013 and 1 January 2014 (n=503)

Variable	Level	OR	95% CI	Wald p value	Likelihood-ratio test p value
Type of rehome	Permanent rehome	1			<0.001
	Permanent loan	0.37	0.24 to 0.55	<0.001	
	Sharer	0.12	0.03 to 0.43	0.001	
	Temporary loan	0.39	0.20 to 0.75	0.005	
Level of rider	Advanced	1			<0.001
	Intermediate	2.31	1.32 to 4.06	0.003	
	Novice	1.85	0.95 to 3.60	0.07	
	Beginner	3.05	1.04 to 8.97	0.04	

**Table 3** Multivariable Cox proportional-hazards model for the time until rehoming for horses listed with an equine rehoming charity between 1 January 2013 and 1 January 2014 (n=449)

Variable	Level	HR	95% CI	Wald p value	Likelihood-ratio test p value
Region	Mid England	1			0.003
	East England	1.04	0.58 to 1.87	0.89	
	Ireland, Wales, other	0.31	0.11 to 0.89	0.03	
	South England	1.57	1.01 to 2.45	0.04	
	North England	0.95	0.54 to 1.65	0.85	
	Scotland	1.80	0.80 to 4.08	0.16	
Radius from current owner	Less than 50 miles	1			0.001
	60 to 80 miles	1.45	0.67 to 3.14	0.35	
	100 miles	2.45	1.14 to 5.29	0.02	
	150 to 200 miles	1.37	0.28 to 6.64	0.70	
	National	3.04	1.50 to 6.16	0.002	
Breed type	Sports horse	1			0.02
	Cob type	1.36	0.73 to 2.54	0.33	
	Foreign and other	1.00	0.51 to 1.97	1.00	
	Native	0.49	0.27 to 0.88	0.02	
	Partbred	0.75	0.4 to 1.39	0.36	
	Thoroughbred	0.57	0.32 to 1.01	0.05	
	Warmblood	0.67	0.36 to 1.23	0.20	
Age	<5 years	1			0.001
	5 to 10 years	1.56	0.76 to 3.19	0.22	
	11 to 17 years	2.89	1.47 to 5.69	0.002	
	>17 years	2.08	1.01 to 4.31	0.05	
Horse being rehomed as a companion only	No	1			0.002
	Yes	0.33	0.15 to 0.74	0.01	
Donation amount	Less than £100	1			0.01
	£100 to £249	1.03	0.67 to 1.6	0.88	
	£250 and £499	2.01	1.31 to 3.08	0.001	
	Greater than £500	2.24	0.68 to 7.41	0.19	

related to the type of home being sought for the horse and the skill of the new rider.

The charity aims to provide owners with a safe way to rehome horses without surrendering the horse, by assessing the suitability of prospective owners and providing a home inspection service. They also screen the horses being listed on the website for rehoming suitability and will discuss other options for horses deemed unsuitable for rehoming with the owner. Although 52% of horses listed for rehoming were rehomed within the study period, 60% of these were not rehomed through the charity. No details were available on how these horses were rehomed and what avenues owners used to rehome them. However, these results are suggestive of owners employing multiple strategies for rehoming horses, once they had decided to do so. An advantage of rehoming a horse through the charity is that new owners of rehomed horses are obliged to rehome them through the charity again if they are deemed unsuitable, despite the rigorous matching process, or if they can no longer keep them for any reason. This provides an additional level of safety for the horse and owners involved in the rehoming process.

In previous studies, age, body condition, sex and colour of the horse have been identified as reasons for the relinquishment or euthanasia of unwanted horses.<sup>2,7</sup> Body condition score and horse colour were

not recorded for horses in the current study. Sex was not associated with time until rehoming or whether a horse was rehomed, although the charity does not allow the listing of broodmares or stallions. Older horses (11 years and older) were rehomed more quickly than those younger than 5 years of age, in contrast to previous studies where older horses were more likely to be relinquished or abandoned.<sup>27</sup> This may be a reflection of the level of training that the horse has received relative to the skill of the potential new owner. Many horses begin their riding careers around 2 to 3 years of age, reaching training maturity at between 6 and 15 years of age, depending on discipline.<sup>14</sup> Potential new owners may be preferentially looking for horses through the charity that are slightly older, horses which may be perceived as well trained and 'safer', in particular if owners are relatively new to horse ownership.

In the current study, only 6% of owners reported rehoming due to behavioural issues. In a previous study, 56% of horses that were relinquished to non-profit organisations in North America required training to modify behaviour prior to being suitable for adoption.<sup>15</sup> Behaviour has been identified as an important reason for owners rehoming, surrendering or returning rehomed companion animals.<sup>16,17</sup> While not a direct measure of behaviour, in the current study horses that were deemed suitable for novice or beginner

riders were more likely to be rehomed, compared with horses that required advanced riders, highlighting the potential importance of a 'safe and sensible' ride to the new owner. However, it could also be a reflection of the population of horse owners seeking to rehome a horse from a charity, with more advanced and competitive riders potentially being less likely to do so. Studies have linked horse behaviour with temperament and the rider's enjoyment of riding,<sup>18 19</sup> factors that could increase rehoming success. Additionally, behaviour is a consideration for the safety of the rider and handlers of the horse.<sup>20 21</sup>

One-fifth of horses available for rehoming were Thoroughbreds. When compared with previous studies in the UK,<sup>22–25</sup> the breeds available for rehoming appear to be similar to the breed demographics reported, with Thoroughbreds and native breeds the most common. In previous studies, the breeds associated with racing had the highest proportion of horses available for rehoming<sup>1 7 26</sup> or slaughter.<sup>5</sup> While the number of Thoroughbreds available for rehoming may reflect the underlying population, Thoroughbreds may be unsuitable for an amateur recreational rider due to their previous racing experience and temperament,<sup>27 28</sup> leading to these horses being available for rehoming.

A limitation of this study was that horses' health conditions were owner reported. Previous studies have identified differences between owner-reported and veterinarian-diagnosed health conditions.<sup>29</sup> Unfortunately, it was not possible in the current study to verify owner-reported health conditions. In the current study, no association was identified between horses with an owner-reported previous health condition and time taken to rehome a horse or whether a horse was rehomed. Horses available as non-ridden companions did take longer to rehome, although this did not seem to affect whether or not they were rehomed. The number of horses available as companions (15% of horses) was comparable with a study of the general population, where 12% of horses were described as companions.<sup>25</sup> This indicates that despite being unable to be ridden, a new owner may have a use for a horse, beyond that of a riding animal.

Social desirability bias has been described previously as an issue for companion animal rehoming studies, which rely on owner reporting of reasons for relinquishment.<sup>17 30</sup> When relinquishing pets, owners often described the situation or reasons regarding surrendering the animal more simply on shelter paperwork than described in confidential face-to-face interviews, due to perceived social pressure. In the current study, horses were listed on a publically available website, so the way the horse was described by the owner may comply with perceived expectations. Consequently, behaviours or characteristics of the horse that could be viewed negatively may have been downplayed or not reported, meaning that associations

may be underestimated in the current study. However, the successful rehoming of horses is reliant on honest descriptions of the horse and the charity always aims to describe the horses and reasons for rehoming as thoroughly as possible, following up with owners to provide more detail where required. This approach is necessary in order to facilitate successful rehoming.

During the listing process, some horses are deemed unsuitable for rehoming by the charity. If this is the case, the charity works with the owner to investigate other options for these horses. While this screening of horses may make this population less comparable with horses that are relinquished to other equine charities or abandoned,<sup>2 7</sup> findings from this study can be used to inform successful rehoming strategies and to identify horses less likely to be rehomed. Younger horses and those requiring a more skilled rider took longer or were less likely to be rehomed. In this respect, there is scope for an independent intermediary to assess the 'rideability' of horses and provide behavioural modification and more education for horses and/or their owners, where appropriate. In addition, current owners can be encouraged to make the horse available for rehoming nationally and to list horses for permanent rehoming, rather than wanting to retain ownership of these horses and/or ensure they stay relatively close by.

Alongside assessing the suitability of the horse, further work on the demographics of people seeking to rehome a horse through a charity should be considered. Many owners noted factors that were not related to the horse as reasons for rehoming: lack of time, money or changes in circumstances. Ultimately, owner education regarding taking a horse in the first instance, whether by rehoming or another method, and being fully aware of the commitment that they are taking on may reduce the 'supply' of horses that are unwanted. Owners may also require further support and education to ensure that if a horse is deemed not suitable for rehoming, euthanasia is considered as an option.

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