

Neonatal and pediatric kitten mortality: a retrospective study of 79 histological examinations post mortem following a natural death.

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Dr. Aurélie Fournier¹, Mrs. Julie Oger¹, Dr. Claire Mariani², Prof. Sylvie Chastant Maillard¹

1. NeoCare, Reproduction, Ecole Nationale Vétérinaire, UMR INRA/ENVN 1225 HIAF, Toulouse, France, 2. Royal Canin, Aimargues, France

Kitten mortality rate (15.9%) is high in France [1]. Identifying the etiology of kitten mortality in catteries turned out to be very challenging. Histology and necropsy are useful tools for diagnostic [2]. However, the frequency of lesions per the different organs are still unknown [3]. Our objectives were to: i) determine the frequency of the observation of lesions per organs ii) estimate the prevalence of infections and iii) describe the main causes of death.

Reports on 79 client-owned kittens under 3 months old (who died naturally), produced between 2007 and 2016, were collected from 4 French laboratories specialized in veterinary anatomo-histopathology.

A quarter of kittens was in the neonatal period, i.e. from 0 to 3 weeks old (n=20, with 16% under 1 week and 9 % between 1 and 3 weeks) and 75% in pediatric period (3 weeks – 3 months, n=59) with 23% between 3 to 4 weeks and 52% older than 1 month. Thirteen breeds were represented (with no information in 6% of kittens, n=5). Right beside 28% of European Shorthair cats, the 3 most represented breeds were Main Coon, Persian and British Shorthair (19%, 10% and 9% respectively). On 334 examined organs, 51% presented a lesion. Lungs, liver, kidneys, intestine and spleen were the 5 most represented samples sent for analysis by veterinarians (15% of the total samples, 13%, 13%, 11%, and 9% respectively). Lungs were damaged in 80% of the cases, vs 23% for liver, 61% for kidneys, 68% for intestine and 48% for spleen. Death was attributed to respiratory pathology in 55% of neonatal deaths (n=11/20). Between 2 and 4 weeks, respiratory affections counted for 39% of deaths (7/18) but digestive diseases were considered responsible for up to 22%, (n=4/18) becoming the first pathology found after 1 month age with a prevalence of 33% (16/48). Histological examination did not allow any conclusion in 15% of kittens in neonatal period, 33% between 2 and 4 weeks and 17% over 1 month of age. Respiratory affections predominated in purebred cats (27% of total deaths for Main Coon, 38% for British Shorthair and 43% for Persian) whereas digestive issues mostly affected European Shorthair. Infections were revealed in 53% (42/79) of kittens with a preponderance of bacterial infection in the neonatal period (69% of infections observed between 0-3weeks, 75% in the first week of life), whereas viral affections were more frequently remarked in the pediatric period: a virus was involved in 57% of the deaths between 3 and 4 weeks and 68% over 1 month. Parasites were detected only in pediatric period.

This work allows browsing an overview of the kitten pathology in neonatal and pediatric periods. A systematic sampling protocol would probably increase the frequency of reaching a conclusive diagnosis.

- [1] Fournier A, et al. *Reprod Domest Anim* 2016. doi:10.1111/rda.12844.
- [2] Lamun CG, Njaa BL. *Vet Clin North Am Small Anim Pract* 2012;42:501–513
- [3] Cave TA, et al. *Vet Rec* 2002;151:497–501.

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A. Fournier^{a,b}, J.Oger^a, C. Mariani^b, S. Chastant-Maillard^a.
^aNeoCare, National Veterinary College of Toulouse, UMR INRA/ENVN 1225 IHAP, Toulouse, France
^bCRECS, L'Isle Jourdain, France, ^c Royal Canin, Aimargues, France.

NeoCare
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Introduction

A total of 7.9% of kittens born, die during the neonatal or pediatric period [1]. Identification of the etiology of kitten mortality in catteries turned out to be very challenging. Histology and necropsy are useful tools for diagnosis [2]. However, necropsic findings are poorly described in kittens [3].

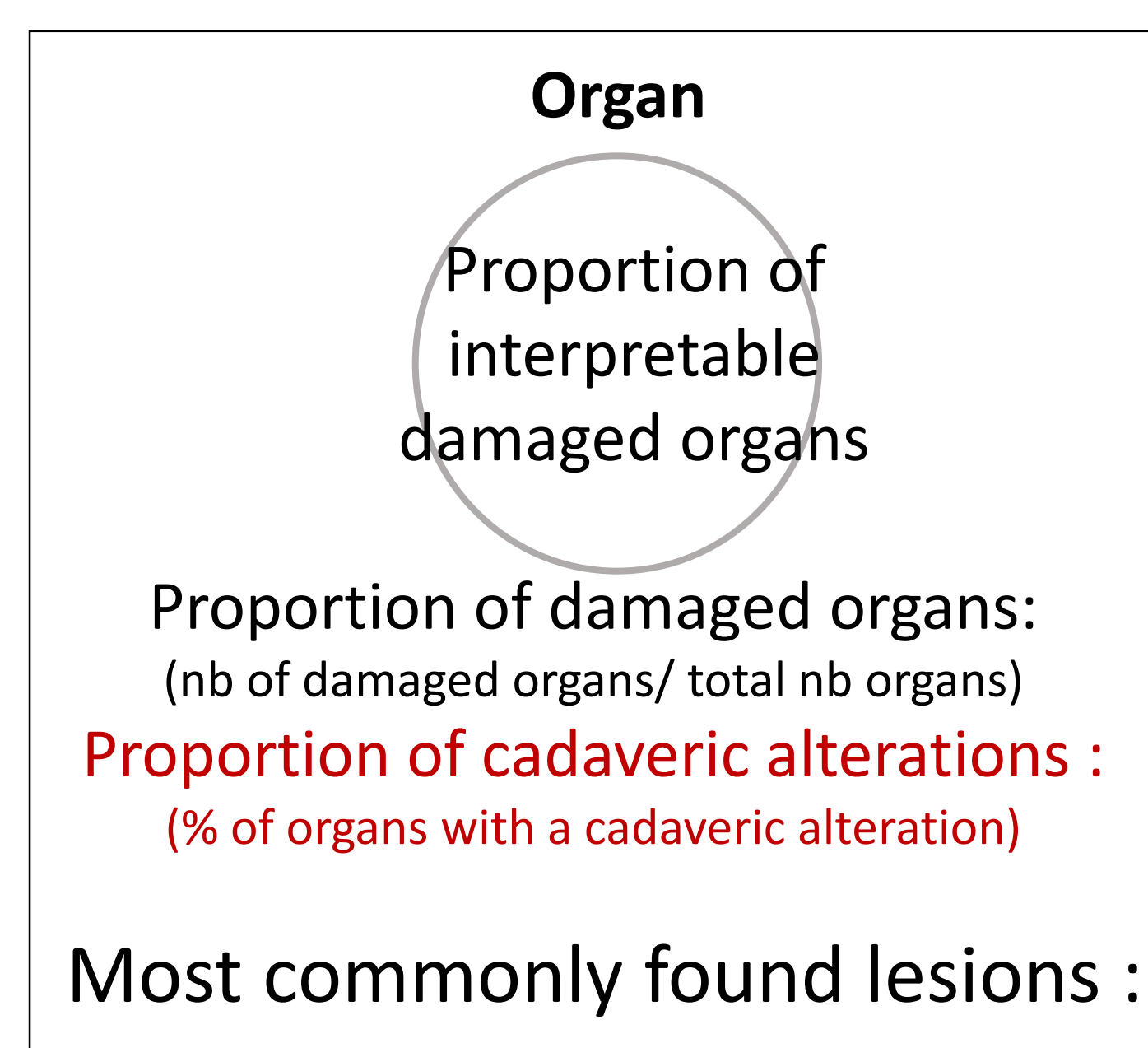
Our objectives were to: i) determine the frequency of the observation of lesions per organ ii) estimate the prevalence of infectious diseases and iii) describe the main causes of death according to breed and age.

Materials & Methods

Reports on 142 client-owned kittens died from natural causes under 3 months of age between 2010 and 2016, were collected from 9 French laboratories specialized in veterinary anatomo-histopathology.

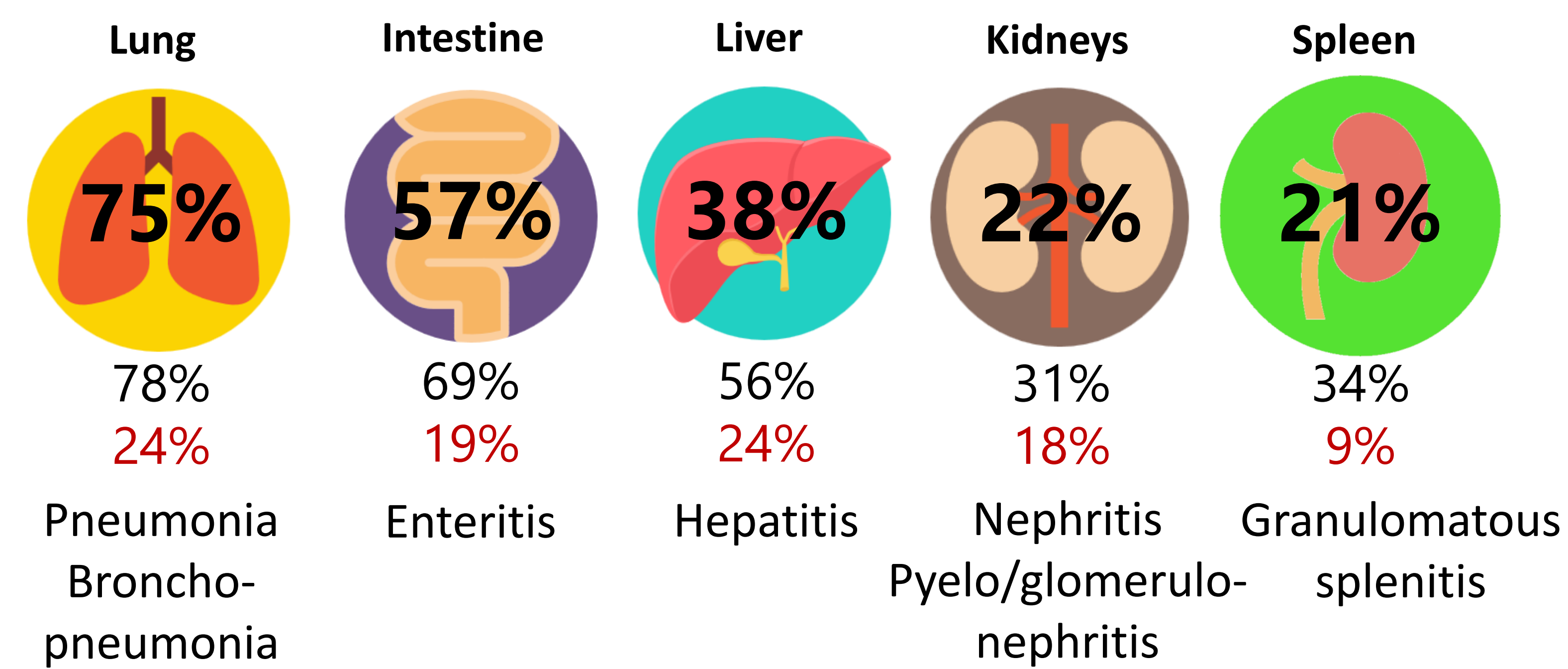


Legend:



Results

The 5 organs most frequently sent for analysis were:



Take Home Message

Application of a **systematic sampling protocol** would probably increase the frequency of reaching a **conclusive diagnosis** thanks to histopathology

Distribution of the population :
 Neonatal period (16 %)

Pediatric period (84 %)

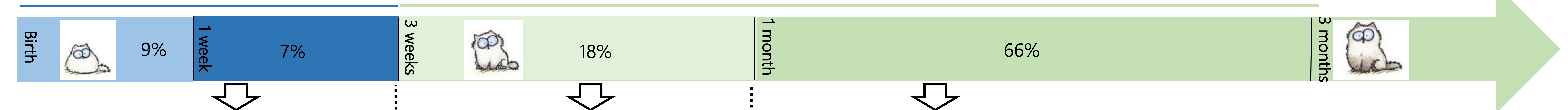
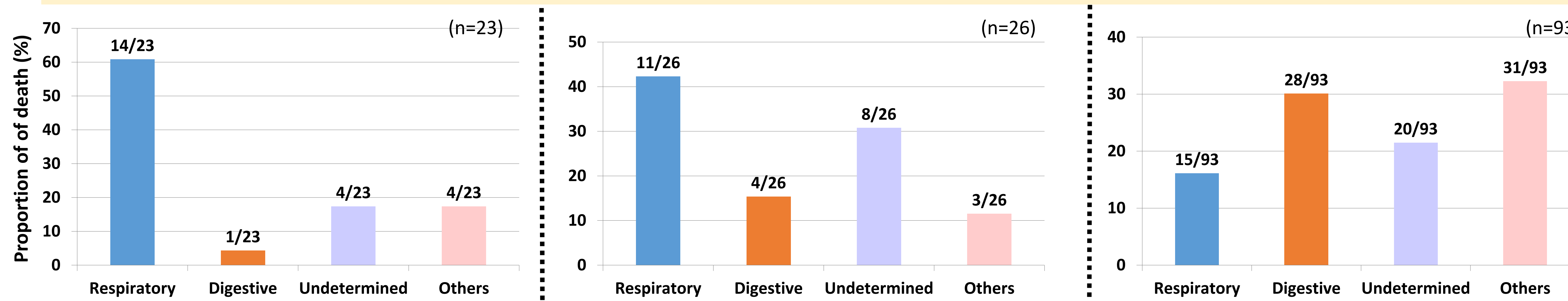


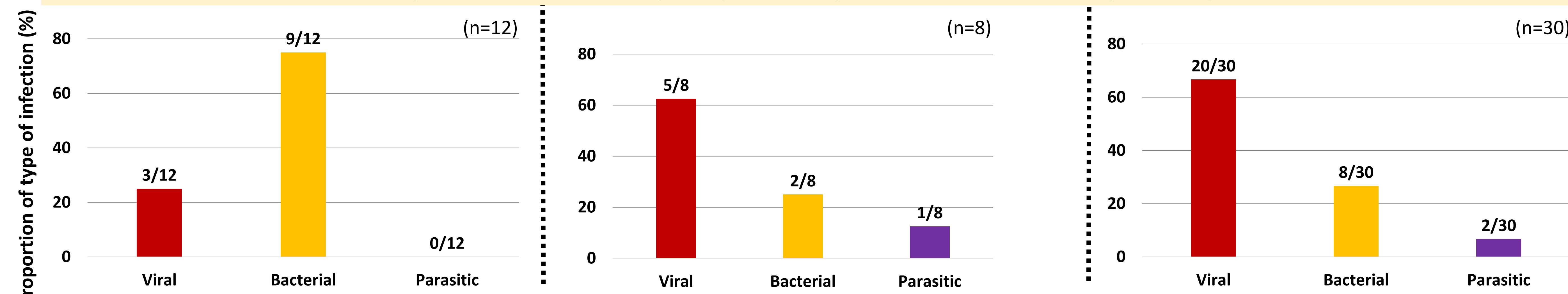
Fig.1: Causes of death according to kitten age



SYSTEM INVOLVED IN DEATH

- Death was predominantly attributed to **respiratory conditions in neonatal period**, then decreasing with age. **Digestive diseases** increased in importance in the **pediatric period** becoming the first cause of death between 1 and 3 months.
- Others causes included congenital, traumatic, neurological, cardiac, urological pathologies...
- No conclusion for 20-30% of kittens** (Fig.1)

Fig.2: Distribution of the pathogens among infected kittens according to the age



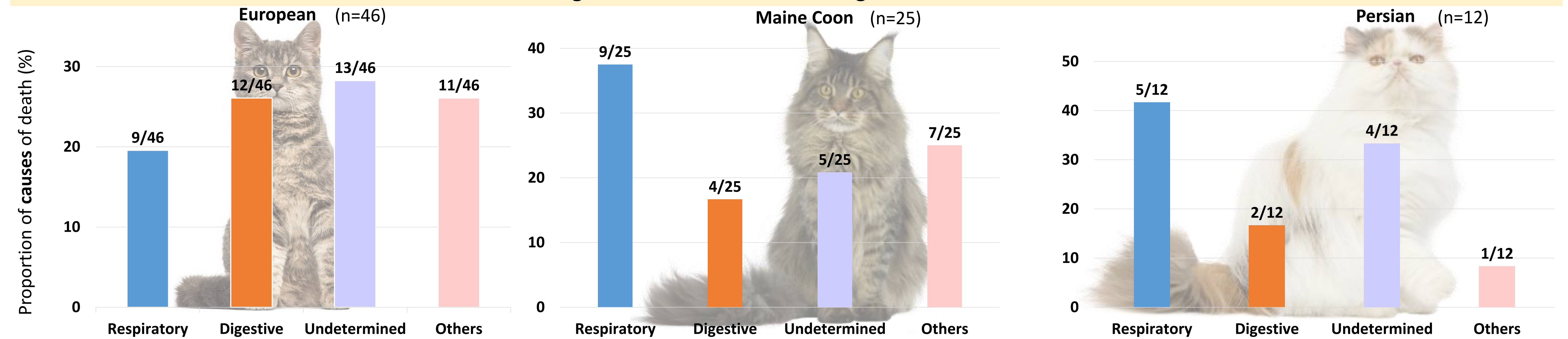
PATHOGEN INVOLVED IN DEATH

- In **neonatal** period: Infections were found responsible for 52% (12/23) of deaths with a preponderance of **bacterial** infection (93% before the 1st week)
- In **pediatric** period: Infections was implied in 32% (30/93) of deaths dominated by **viral** infection
- Parasites** were detected only in **pediatric period** (Fig.2).

Take Home Message

Respiratory affections predominated in **purebred cats**, **digestive** in **European Shorthair** (potentially due to European kitten being necropsied in pediatric period, after their adoption by private owners)

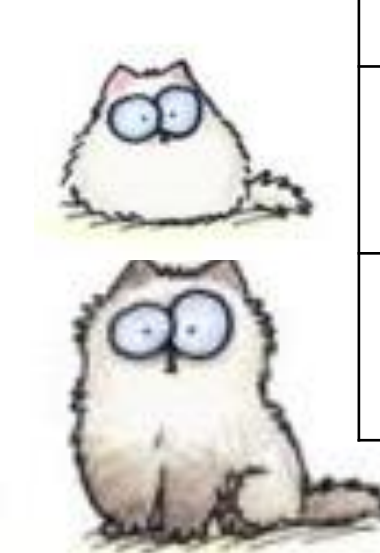
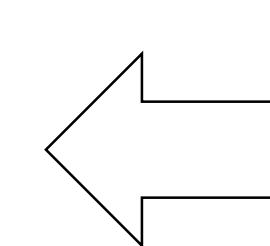
Fig.3: Causes of death according to kitten breed



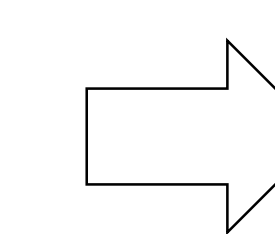
Conclusions

Promote prevention:

- Hygiene of catteries
- Desinfection of umbilical cord
- Exclude systematic use of antibiotics for public health concerns



CAUSES OF KITTEN DEATH		
Under 3 weeks of age	Respiratory	Bacterial
After 3 weeks of age	Digestive	Viral and parasitic



Post mortem examination should be associated with the **identification of pathogens by PCR**

