

Norwich Terrier Breed Health Survey Results, 2021

Jane Schubart

NTCA Health Committee

November 17, 2021

Survey Purpose & Design

- Primary goal: to understand the current health status of Norwich terriers
 - Periodic breed health surveys are recommended by AKC-CHF.
- Design: cross-sectional (a snapshot in time)
- Comprehensive, organized by body system

*For deceased dogs: several questions to assess age at death and cause of death

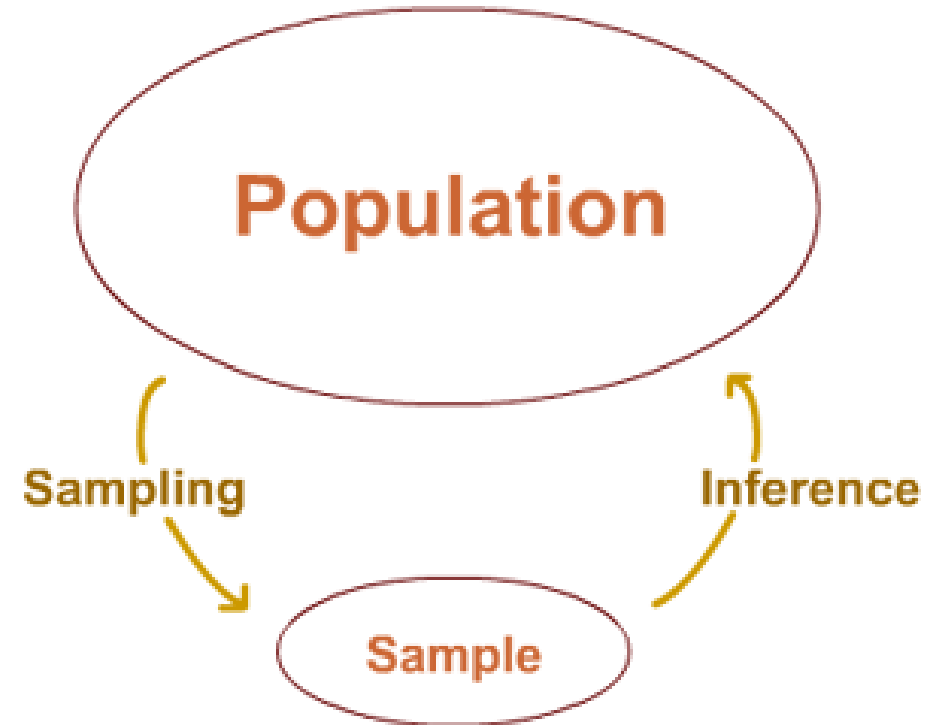
Survey Design

- **Who to survey?**

- In an ideal world, **all owners** (population) of Norwich terriers would receive the survey and all would reply.

- **How to survey (sample)?**

- Web-based survey (Survey Monkey)
 - Advantage: least expensive for large samples
 - Downside: results may not be generalizable to the population as a whole



Survey Methods

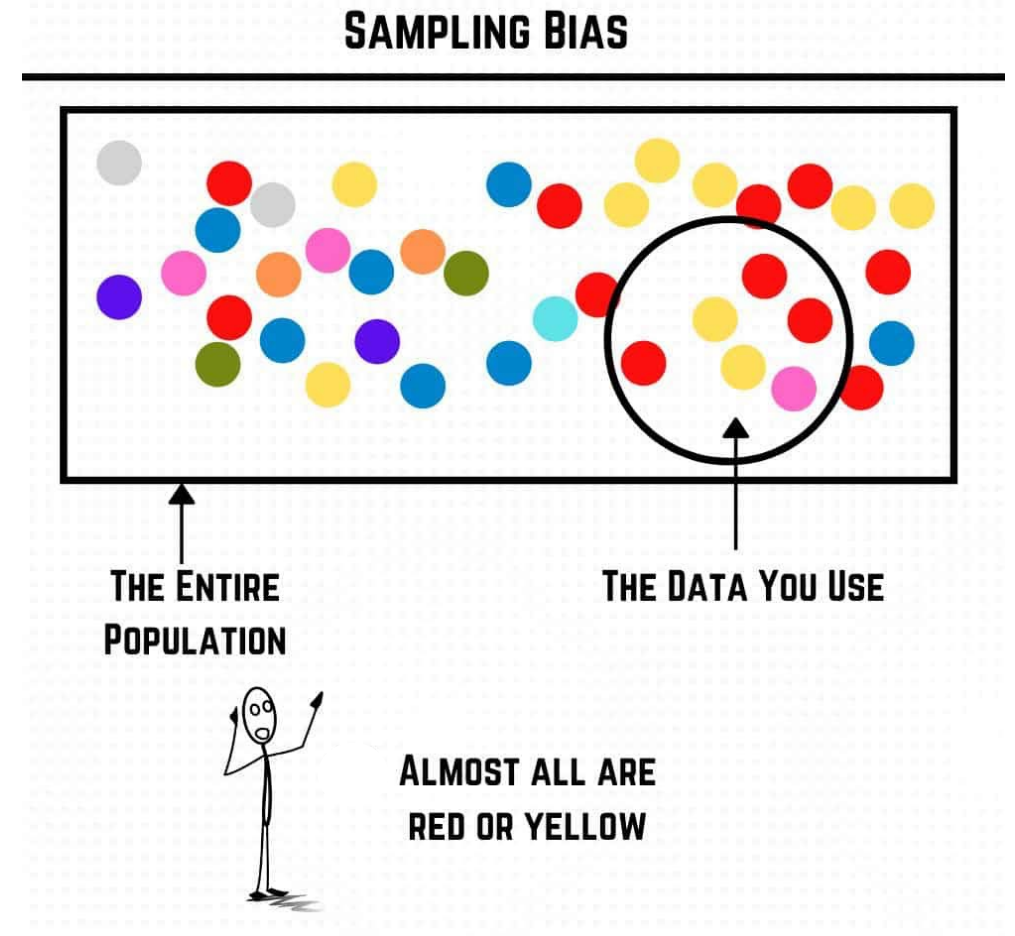
- Used both correct medical terms and common disease names and definitions.
- For most questions, asked how the illness was diagnosed (e.g., veterinarian).
- Used branching logic to reduce survey length.
- Consistent question formatting and scale.
- Text boxes for additional free form comments.
- Reviewed and tested by a subgroup of owners; modified as needed.

Survey Methods

- Launched using Survey Monkey to NTCA members and via social media Norwich terrier pet groups.
 - A separate survey questionnaire was required for each dog.
- Multiple were reminders sent.
- Owners completed surveys from 6-10-21 to 9-1-21.
- Almost all respondents completed the entire questionnaire.

Do we have a representative population?

- What is the size of the Norwich Terrier population?
 - Unknown and unknowable
- What is the size of our survey sample?
 - **588** dogs (alive) > 1 year of age
 - **180** deceased dogs > 1 year of age at time of death
 - 86% AKC registered; 10% not AKC registered; 4% did not know



Sample: Age 1 year and older

There were 45 dogs < 1 year old not included in analyses.

Who completed the surveys?

	N	
owner	502	85 %
co-owner	75	13 %
not owner	11	2 %
Total	588	100 %

	N	
not the breeder	421	72 %
breeder	167	28 %

Sample characteristics (alive dogs): Age 1 year and older

Age (years)

- Mean = 9.7 years
- Range 1-17

• Sex

- Male = 326 (55%)
- Female = 262 (45%)

• Ever had a litter?

- Yes = 40%
- No = 58%
- Not sure = 2%

Current Weight: 20% were > ideal

	N	%
BODY CONDITION		
Very thin	2	
Underweight	9	2 %
Ideal body fat	462	79 %
Overweight	110	19 %
Obese	4	1 %
Total	587	100

no significant differences by sex or age

Spayed females were more likely to be overweight

Females	Weight (% body fat)					Total
	Very thin	Underweight	Ideal	Overweight	Obese	
not spayed	0	2	69	6	0	77
spayed	1	0	135	46	2	184
						261

→ 70 %

Pearson chi2 = 15.934 p-value = 0.003

Neutered males also more likely to be overweight

	Weight (% body fat)					
Males	Very thin	Underweight	Ideal	Overweight	Obese	Total
not neutered	0	2	113	12	0	127
neutered	1	5	146	46	2	200
						327

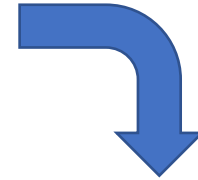
61 %

Pearson chi2 = 12.761 p-value = 0.013

Heart Disease

Heart Disease = 2%

	N	
No	559	95 %
Yes	9	2 %
Not sure	16	3 %
Total	584	



ECHO STUDY	N	
No	528	91 %
Yes	34	6 %
Not sure	21	3 %
	583	

DIAGNOSIS	N
Cardiomegaly	5
Congenital cardiac disease	3
Dilated cardiomyopathy	0
Pulmonary edema	2
Valve insufficiency	0

Heartworm disease

- Heartworm disease = 1 % (7 of 583)
- Taking heartworm preventative = 83%

Respiratory System

Does your Norwich have increased respiratory noise?

	N	
no	425	73 %
yes	132	23 %
not sure	26	4%
Total	583	

If yes, main breathing problems?

cough	13
panting	49
gagging	8
gurgly	15
loud	49
raspy	44

Signs worse when:

excitement	36
exercise	25
hot weather	34
humid weather	15
all of the above	56

Ever collapsed gasping for air?

	N
no	120
yes	8
not sure	3

Respiratory

- Has your Norwich had an endoscopy?

no	436	75 %
yes	133	23 %
not sure	10	2 %
	579	

- Has your Norwich had corrective surgery?

no	522	90 %
yes	53	9 %
not sure	4	1 %
	579	

1 dog had temporary trach
2 dogs had permanent trach

Tonsillitis?

- Yes = 9 dogs of 580 ($< 2\%$)
 - 5 treated with antibiotic
 - 4 had surgery

Respiratory: Nasal

- Nasal symptoms? (N=580)
 - Sneezing = 138 (24%)
 - Snoring = 154 (27%)
 - Reverse sneezing = 201 (35%)
- Treated for a nasal condition?
 - Polyps = 28 (5%)
 - Foreign body = 1 (< 1%)
 - Nasal mites = 4 (< 1%)

Tracheal Collapse

	N	
no	556	96 %
yes	17	3 %
not sure	6	1 %
Total	579	

Grade	N
1	1
2	2
3	2
4	1
don't know	11
Total	17

Age at dx	N
6 - 9 mos	1
10 - 11 mos	1
1	2
3	1
4	2
5	3
6	1
8	3
9	1
14	2
Total	17

Pulmonary System

pneumonia

pneumonia	Freq.	Percent
no	567	98 %
yes	6	1 %
not sure	6	1 %
Total	579	100 %

aspiration type = 4

infection type = 2

treated with antibiotic = 6

treated with oxygen = 4

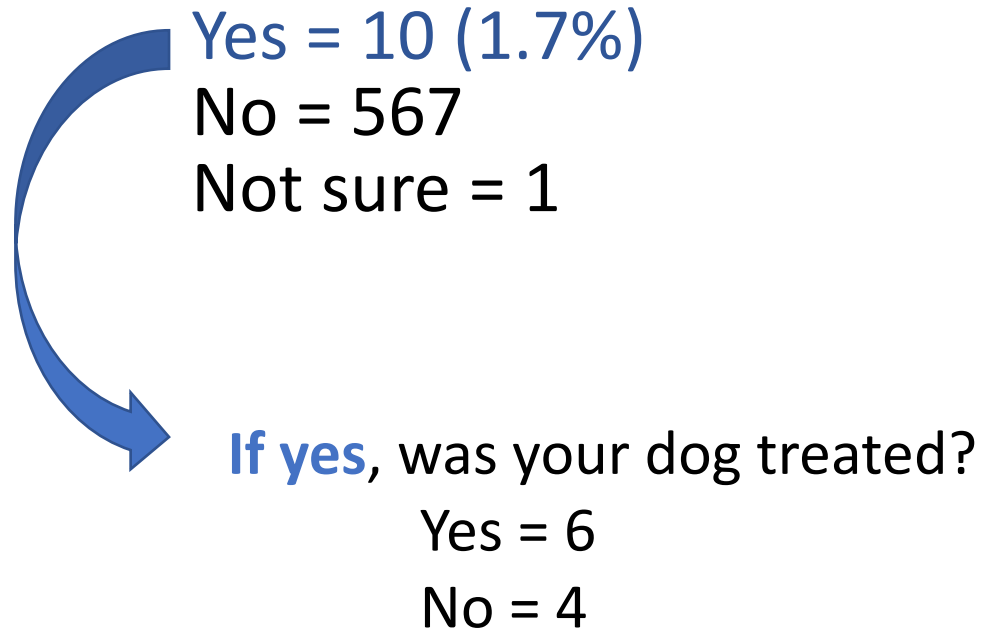
Neurology

- Seizures
- Movement Disorder

Neurology: Seizure

Have you ever observed your dog having a Grand Mal Seizure?

A Grand Mal Seizure causes a loss of consciousness and violent muscle contractions...



Neurology: Movement Disorder

Has your dog exhibited a movement disorder, other than Grand Mal Seizure?

	Freq.	Percent
No	536	92 %
Yes	39	7 %
Unsure	3	
Total	578	



If yes, did your dog have any of the following?

Low blood sugar

Head injury

Hypothyroidism

Spinal cord injury or slipped disk

None of the above = 39

Neurology: Movement Disorder

- Does your dog experience any of the following?
 - Weakness in the hind legs. N=9
 - Uncontrolled movements in the hind legs. n=13
 - Dragging or knuckling of the hind feet. N=2
 - Dragging or knuckling of the front feet. N=3

Paroxysmal Dyskinesia **episodic movement disorder**

Does your Norwich experience prolonged episodes of muscle cramping?

	N	
No	533	93 %
Yes	29	5 %
Not sure	13	2 %
Total	575	

Paroxysmal Dyskinesia N = 29

Are you able to distract your Norwich during these episodes?

Yes = 17 59%

Does the dog remain conscious?

Yes = 29 100%

Do these episodes occur after strenuous exercise, excitement, change in usual routine, or other “triggers”?

Yes = 6

No = 16

Not sure = 7

Paroxysmal Dyskinesia N = 29

Any of the following treatments?

- Gluten-free diet = 2
- Purina NeuroCare diet = 2
- Purina Bright Minds diet = 3
- Vitamin E supplements = 2
- Acetazolamide = 0
- Clonazepam (brand name Klonopin) = 1
- Phenobarbitol = 2
- Zonisamide = 4
- Other = 4 (selenium, HA Purina)

Degenerative Myelopathy (DM)

	N	
No	570	99 %
Yes	0	0 %
Not sure	7	1 %
Total	577	

No cases of DM reported

Liver Disease

Elevated liver enzymes

	N	
no	540	94 %
yes	29	5 %
not sure	6	1 %
Total	575	



If yes:

No reported cases of

Leptospirosis

Infectious canine hepatitis

Congenital liver cysts

Chronic cirrhosis

Liver associated diabetes

Liver toxins

Autoimmune chronic hepatitis

Heartworm infection

Associated with older age (p-value = 0.014) but not weight

Reported cases of

Liver associated Cushing's syndrome n=2

Primary or metastatic tumors n=1

Liver shunt (congenital) n=1

Bile duct stones or disease n=2

Pancreas

Acute Pancreatitis

	N	
no	551	96%
yes	22	4%
not sure	2	< 1%
	575	

Acute Pancreatitis (if yes n=22)

Diagnosed more than once?

Yes=4, No=18

Associated with:

- High fat diet -- 7
- Obesity -- 1
- None of the above -- 8

8 dogs required hospitalization

4 dogs were obese at onset

12 were spayed or neutered at onset

Age at 1st episode varied widely: 6 months to 14 years

Exocrine Pancreatic Insufficiency (pertaining to secreting glands)

- Has your dog ever been diagnosed with pancreatic insufficiency?
 - 574 of 575 answered No
 - 1 said Unsure


RENAL (Kidney & Bladder)

Bladder disease

	N	Percent
no	563	98%
yes	10	2%
not sure	2	< 1%
Total	575	

- **If yes**, cystitis (inflammation of bladder)? n = 9
 - Associated with?
 - Bladder stones = 5
 - Prostatitis
 - Diabetes mellitus
 - Steroid use
- Antibiotics given = 9
- Recurrence in 4

Bladder stone



	N	
no	558	97 %
yes	14	2 %
not sure	2	< 1
Total	574	

Did the dog have a recurrence?

No = 8

Yes = 4

Not sure = 2

Type?

Struvite = 5

Calcium = 4

Uric acid = 1

Cystine = 1

Don't know = 3

Associated with?

Bacterial infection = 6

Bloody urine = 3

Obstruction = 2

Urinary incontinence

	N	
no	537	93%
yes	32	6%
not sure	5	1%
Total	574	

Spayed or neutered?

No = 19

Yes = 11

Associated with increasing age

Urinary incontinence N=32

- Associated with any of the following?
 - UTI = 5
 - Excessive drinking (e.g., Cushing's, diabetes) = 3
 - Inherited neuropathy = 0
 - Prostate disorders = 1
 - Spinal cord injury or degeneration = 0
 - Trauma = 0
 - Weak bladder = 0
 - Other (Struvite stones, internal bleed from spay, old age)
 - Unsure =13

Inflammation in part of the kidney (Nephritis) = 1 case

- Associated with liver disease

Kidney Infection (Pyelonephritis) = 3 cases

Excess protein loss in urine resulting from edema (Nephrotic Syndrome)
= 0 cases

Acute Renal Failure = 2 cases

- Chronic – 1 case
- Caused by trauma – 1 case
- *Only symptom reported was weakness/lethargy*

Cystic Renal Dysplasia = 0 cases

Hematology and Oncology

Hematology and Oncology

Ever had masses or tumors on the skin?

	N	
No	541	95%
Yes	27	5%
Total	568	

Benign = 24

Malignant = 3

Malignant tumor types:

Mast cell tumor = 1

Melanoma = 1

Soft tissue sarcoma = 1

Other cancer types

- Lymph nodes or glands (lymphoma) = 1 case
 - Age 13 years at onset
 - Opted for no treatment
- Breast or testicular cancer = 0
- Adenocarcinoma of thyroid = 2
 - Ages 8 and 11 years
 - Both had surgery
- Hemangiosarcoma (blood vessels, likely spleen) = 0
- Leukemia = 1
- Blood or clotting of blood disorder = 0

Digestive Tract

- Type of food primary fed

	N	
Commercial (canned or kibble)	366	65%
Raw diet	34	5%
Home-cooked	17	3%
Other	54	10%
Mixed	96	17%
Total	567	

Digestive Tract – diagnosed with any of the following?

	Yes, once or twice	Yes, on-going	No	Unsure
Colitis	14	2	543	7
Diarrhea	146	10	407	4
Food allergies	18	16	525	7
Inflammatory bowel dz	9	13	538	6
Kidney disease	6	6	550	4
Lymphangiectasia	1	2	556	7
Pancreatitis	20	5	535	6
Protein losing enteropathy	0	6	556	4
Sensitive stomach	39	17	503	7

Neoplasia

a new often uncontrolled growth of abnormal tissue, maybe benign or malignant

- Yes, once or twice = 5
- Yes, chronic (on-going) = 1
- No = 557

TYPE	
Gum	1
Intestinal adenocarcinoma	1
Soft Tissue Sarcoma	1
Splenic nodular hyperplasia	1
Benign oral epluis	1
Oral carcinoma	1

Other common diseases: Thyroid (566 responded)

- Hypothyroidism = 4 cases
 - Age at onset: 4, 5, 8, and 10 years
 - All treated with levothyroxine or other drug
- Thyroid tumor = 2 cases
 - Age at onset: 8 and 11 years
 - Both surgically removed, no chemotherapy

Other common diseases (n=566 responded)

- Cushing's Disease = 1 case
 - Age at diagnosis = 12 years
 - Type = pituitary dependent
- Addison's Disease = 1 case
 - Age at diagnosis = 10 years
- Diabetes Mellitus = no cases

Anal gland problems

	N	
No	530	93%
Yes, once or twice	27	5%
Yes, chronic (on-going)	4	1%
Unsure	5	1%
	566	

Eye conditions

Cataracts = 37

Cherry eye = 3

Conjunctivitis = 29

Corneal damage = 3

Dry eye = 7

Glaucoma = 1

Iris atrophy = 1

Primary lens luxation (PLL) = 1

Progressive retinal atrophy (PRA) = 2

None of the above = 473

Other: corneal fibrosis, blocked tear duct, episcleritis, lenticular sclerosis, nuclear sclerosis, old age vision loss, eye injury

Ear conditions:

Displayed ear discomfort related to the following?

	Yes, acute	Yes, chronic	# responding
Scratching	40	23	499
Head shaking	22	13	527
Bacterial infection	20	7	535
Fungal infection	16	11	535
Ear odor	12	11	539
Allergies, food	7	16	539
Allergies insect bites	9	9	544
Ear mites	10	5	547
Discharge from ear, bloody	0	6	556
Discharge from ear, brown	8	16	538
Discharge from ear, yellow	2	5	555
Foreign body	2	4	556

Ears: Vestibular Disease

- Displayed symptoms?
 - No = 545
 - Yes = 8
 - Not sure = 9
- If yes, age at diagnosis
 - 8 years, 9 years, 14 years (x5), 15 years
 - Main symptom: lack of balance, wobbly gait

Oral Health

Oral Health (n=562)

- 301 (54%) brush the dog's teeth
- 332 (59%) had dental cleaning under anesthesia
 - Most were age 10-15 years
 - Highly correlated with age ($p < 0.001$)
- 219 (39%) had teeth removed
 - Most were age 4-9 years
 - Highly correlated with age ($p < 0.001$)

Oral Health (n=562)

- Dental disease = 75 cases (13%)
 - Highly correlated with age ($p < 0.001$)
- Periodontal disease = 53 (9%)
 - Not correlated with age
- Chronic ulcerative periodontal stomatitis (CUPS) = 4 cases
- Growths, masses removed from mouth = 11 (2%)
 - Epulis – 2, squamous cell carcinoma – 1, non-cancerous – 1, fibrosarcoma – 0, melanoma – 0, osteosarcoma – 0

Orthopedic

Participate in Dog Sports (n=562)

- None = 338
- Conformation = 141
- Agility = 66
- Obedience = 37
- Barn hunt = 30
- Earthdog = 21
- Scent work = 21
- Rally = 20
- Fastcat = 15
- Lurecoursing = 11

Injuries secondary to sports injuries that required a vet exam?

- Minor, pulls & strains = 33
- Soft tissue injuries = 13
- Ligament repairs (CCL) = 7
- Joint injuries = 5
- Dislocations, hip or shoulder = 3
- Fractures = 3
- Major, requiring surgical or medical procedure = 1

Diagnosed congenital or inherited musculoskeletal conditions

- No = 512
- Yes = 33 (6%)
- Unsure = 16

If yes,

- Hip dysplasia = 8 (none had surgery)
- Luxating patella = 24 (1 had surgery)
 - Grade 1 = 9
 - Grade 2 = 3
 - Grade 3 = 1
 - Grade 4 = 1
 - Unknown = 10

Give supplements for joint and muscle health?

- 118 get supplements (21%)
 - Highly correlated with age (most were 10+ years)
 - Fish oil, glucosamine, others

Allergies

Inhalant and Contact Allergies

- Inhalant allergy (expressed by itchy skin) = 61 (10%)
- Contact allergy (including flea) = 26 (4%)

- Treatments
 - Antihistamines = 36
 - Apoquel = 23
 - Cytopoint injection = 27
 - Restricted diet = 12
 - Other = 15
 - Allergen specific immunotherapy (x4), Aloe, various shampoos, oral steroids & bronchodilator

Tested for tick-borne disease?

- No – 326 (58%)
- Yes – 188 (34%)
- Don't know – 46 (8%)

If yes, which tick disease?

- None – 127
- Lyme – 44
- Anaplasmosis – 9
- Borrella – 1
- Erlichiosis – 6
- Rocky mountain spotted fever – 6
- Don't know – 8

Flea and Tick Prevention (n=559)

- Flea & tick, topical = 32%
- Flea & tick, oral = 45%
- Flea only, topical = 2%
- Flea only, oral = 2%
- None = 20%

Any side effects?

- No = 94%
- Yes = 6% *main symptom = itching*

Phobias?

Yes = 213 (38 %)

- Fireworks = 150
- Thunder = 161
- Separation anxiety = 46
- Vet visit = 36
- Car rides = 35
- Hats, sunglasses = 2

Other comments – text box

Any loud noise

Automatic car wash

Does not like to be picked up

Helicopters/airplanes, large trucks

Lives mostly in rural VT - hates NYC

Loud talking & loud music

Only after lightning hit the barn

Plastic Bags

Reactive to any loud noise

Scared of cats, groomer, water, other dogs

Very anxious in general, afraid of everything

Vacuum cleaners; sneaker squeaks

Other health conditions (text box)

gallbladder issues

several reported age-related osteoarthritis of the hips, back

2 episodes hemorrhagic gastroenteritis: 1 serious at age 9, 2nd episode less severe

low plasma protein; slightly anemic, “abdominal wave” due to low plasma protein

deaf

elongated soft palette

heart murmur

thrombocytopenia

copper storage condition - medication and low copper diet

vaccine induced vasculitis affecting the skin and nails

1 week delayed anaphylaxis reaction, collapse/shock due to rabies vaccine, age 10

SUMMARY -- Low cases of the following:

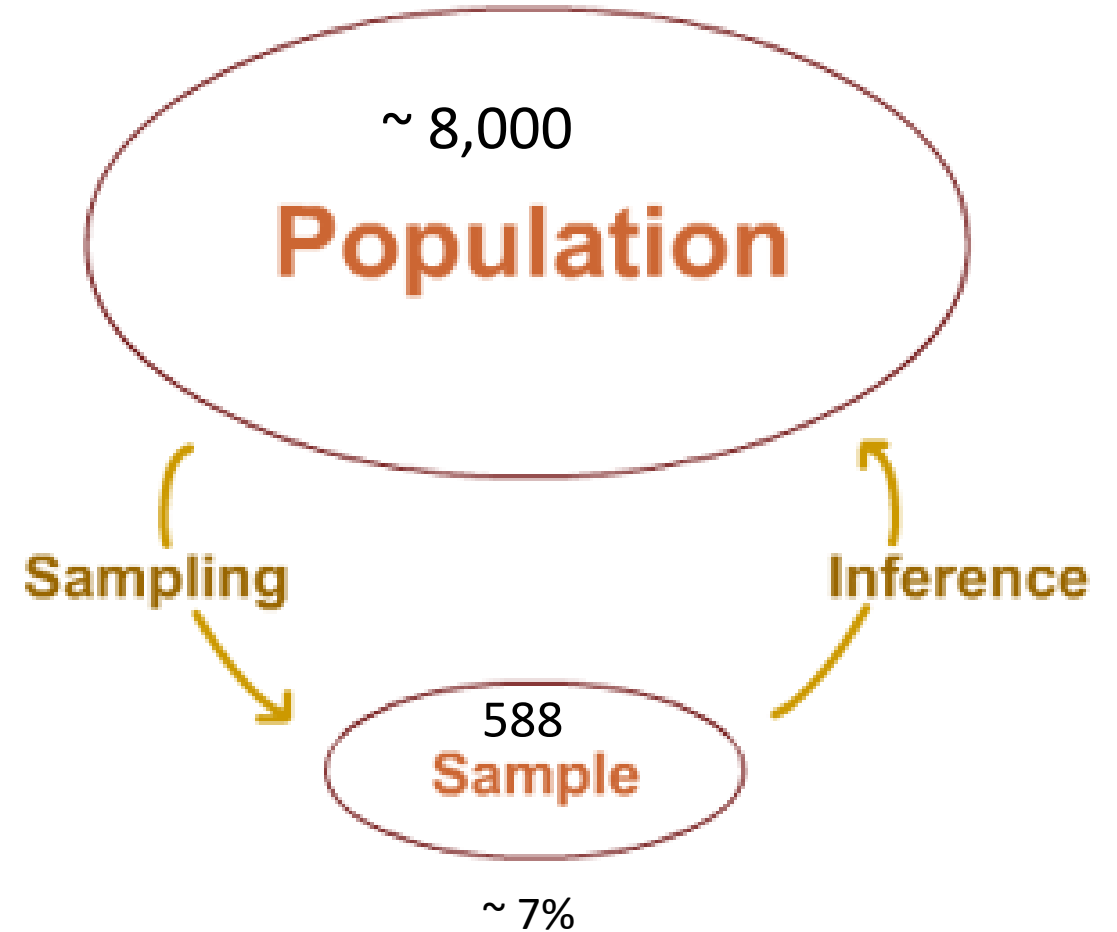
- Heart disease – 2%
- Seizures (Grand Mal) – less than 2%
- Low liver disorders
- Low kidney disease
- Low acute pancreatitis – only 4 cases that occurred more than once
- Low bladder disease – 2% and only 4 cases more than once
- UTI and urinary incontinence largely associated with old age
- Low ongoing anal gland problems
- Low masses/tumors on skin (27, of which only 3 malignant)
- Congenital or inherited musculoskeletal (hips, patella) 6%

SUMMARY -- Most prevalent health issues:

- Respiratory
 - Noisy breathing reported by 23%
 - 6% reported collapsing, gasping for air
 - 9% had corrective surgery
 - 3% reported tracheal collapse (however, most did not know Grade)
- Oral health, dental 13%
- Allergies, inhalant (10%) and contact (4%)
- Movement disorder
 - 7% (39 cases) of which 29 said dx = Paroxysmal Dyskinesia
- Digestive (ongoing IBD, sensitive stomach), food allergies
- Ear discomfort

Statistical Inference

- Can we make inferences about the larger population of Norwich terriers based on sample of ~ 7% ?
- 86% were AKC-registered; 10% were not; 4% did not know
 - No significant differences by AKC-registration status

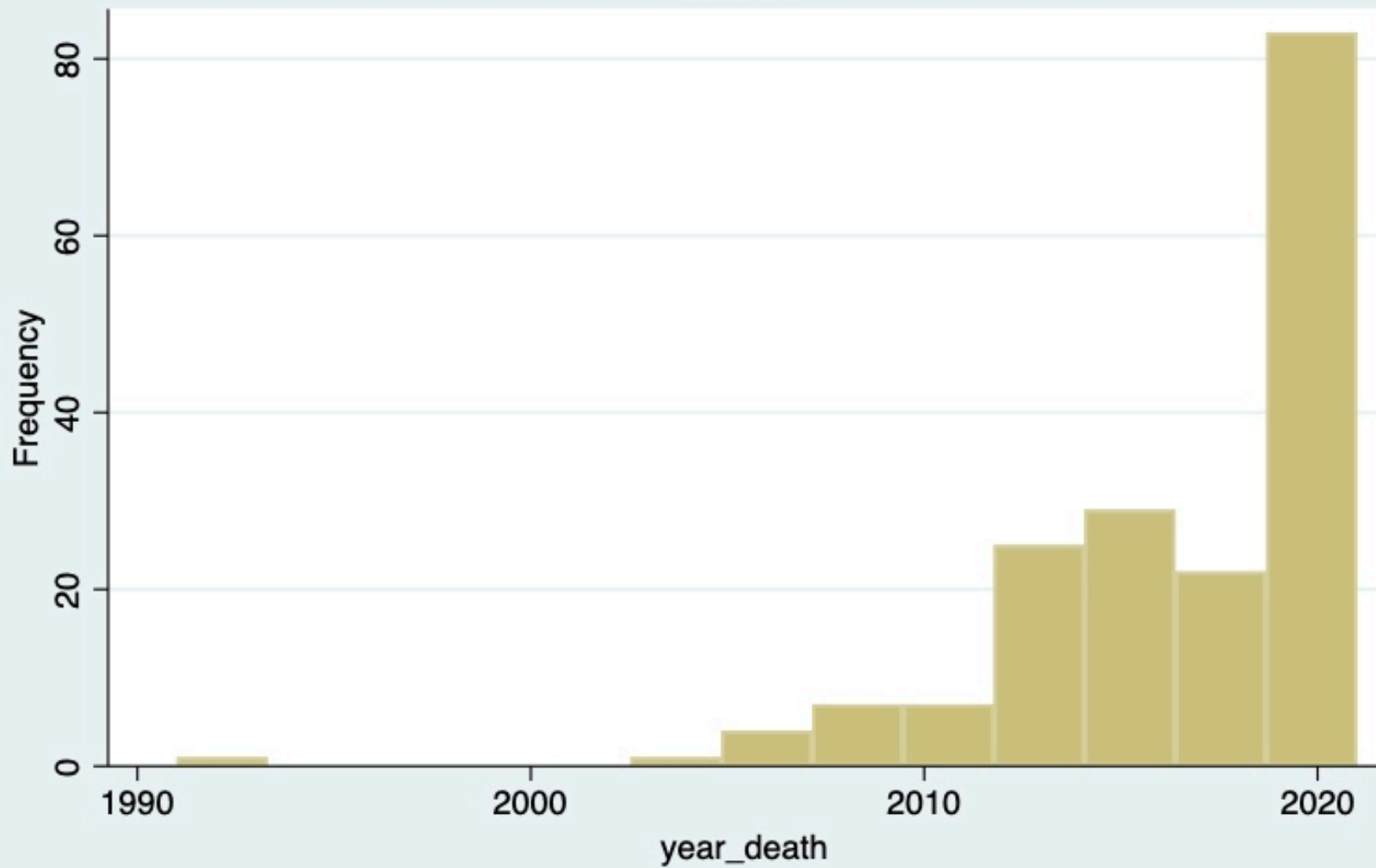


Mortality

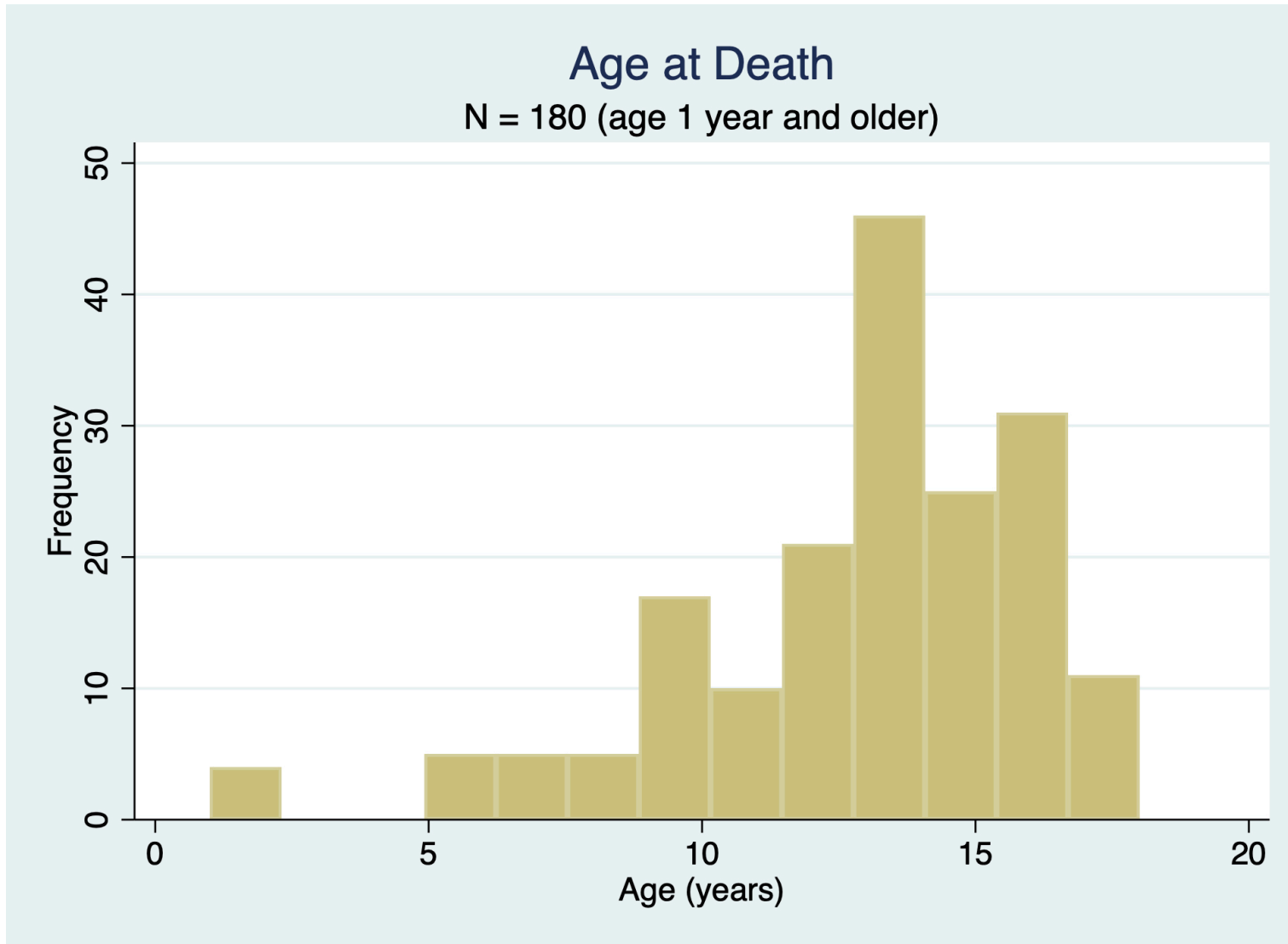
1 year and older

Deceased dogs, year of death

N=180



median age at death = 13.5 years, range 1-18, IQR 11-15



NOTE: excludes 5 deaths reported in dogs <1 year: trauma, 2 respiratory (pneumonia), viral infection, bacterial infection

Cause of Death

	N
old age	47
cancer	41
other	25
respiratory	16
kidney disease	12
heart disease	11
trauma	7
liver	4
seizures	2
surgical complications	2
multiple causes*	4
unsure	9
Total	180

*heart+respiratory x3; kidney+resp.

Our Team

NTCA Health Committee

- Jan Birchall
- Magda Chiarella
- Amy Clark
- Susan Miller Hall
- Rainee Johnson
- Rhonda Krupp
- Deb Lang
- Jane Schubart (Chair)

Technical Support

- Melanie Bryson