

# “Pelp”

Yelp for your pets and keep healthy

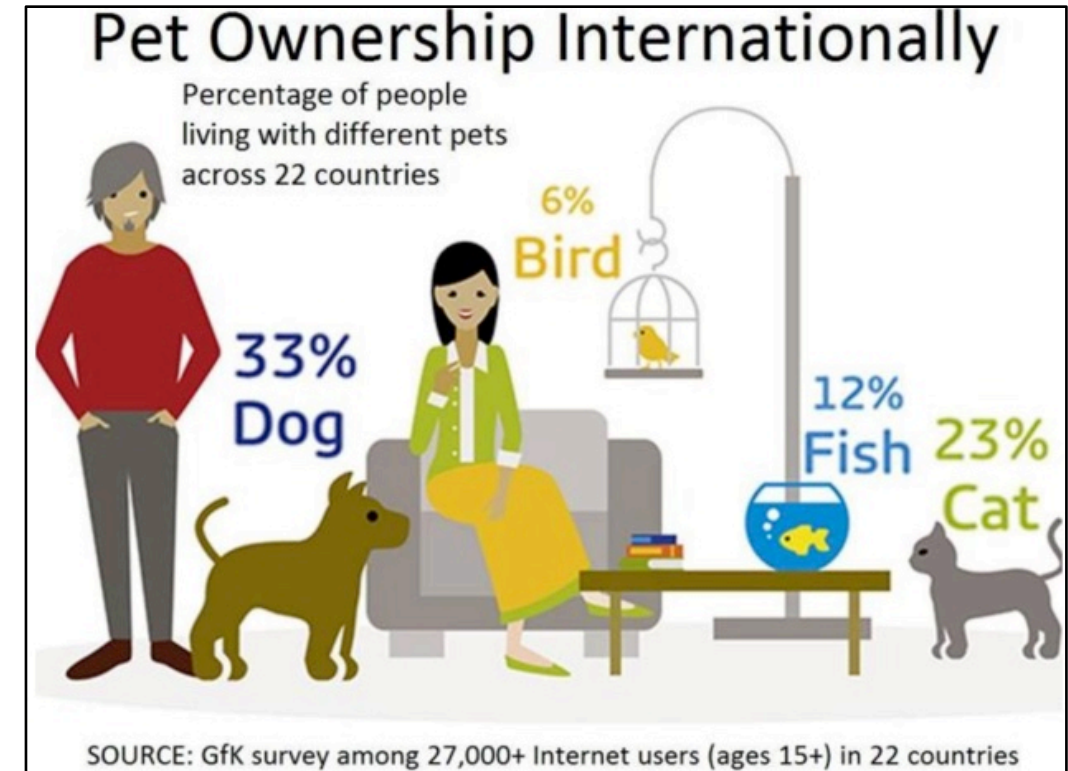
Guillermo Reyes (Speaker)

Yuma Nambu (Author of this slide deck)

# Relationships b/w Pets and People's Health

The importance of psychological health

- Pet ownership benefits people = **“ONE HEALTH”**  
(*Beyond One Health: From Recognition to Results, University of Illinois College of Veterinary Medicine*)
  - Increased level of physical activity
  - A decrease in the incidence of allergies and asthma
  - Reduced blood pressure
  - Lower triglycerides
  - Improved cardiovascular health
  - Reductions in loneliness and depression
- Pet owners are responsible for pets' well-being
  - Reduce stress and stressful behaviors
  - Increase in life expectancies
- Generally, humans agree that animals such as dogs experience emotions—especially basic emotions stated as evolutionary adaptive.



- Globally, 57% of consumers (27,000+ online consumers in 22 countries) own pets
- 65%+ US households have 1+ pet

Source:

INFOGRAPHIC: Most of world owns pets; Dogs are tops, LIVES INTERTWINED: PETS, PEOPLE, AND 'ONE HEALTH', CDC: Healthy Pets, Healthy People "About Pets & People", Milamaaria. V. K. et al. (2017) "Human Empathy, Personality and Experience Affect the Emotion Ratings of Dog and Human Facial Expressions", PLoS One; 12(1). Doi: 10.1371/journal.pone.0170730

# Methodology – Psychological State

## Use of ECG (Electro Cardio-Graphy) Sensor

- ECG is a reference standard signal that is used for monitoring the bio-potential generated by electrical signals that control the expansion and contraction of heart chambers
- Previous study (Charlton et al, 2016) shows ECG-based algorithms are preferable to PPG (Photo Plethysmo-Graphy), when monitoring respiratory rate (RR)
- Some studies describe the relationship between RR and emotions (Homma and Masaoka, 2008 and 2001)
- RR is a useful indicator of health states
  - High: Anxiety, Fever, Respiratory diseases (e.g. asthma, pneumonia, COPD), Heart Problems, Dehydration

Source:

Charlton. P. H. et al. (2016) "An assessment of algorithms to estimate respiratory rate from the electrocardiogram and photoplethysmogram.", *Physiol. Maas.* 37 610

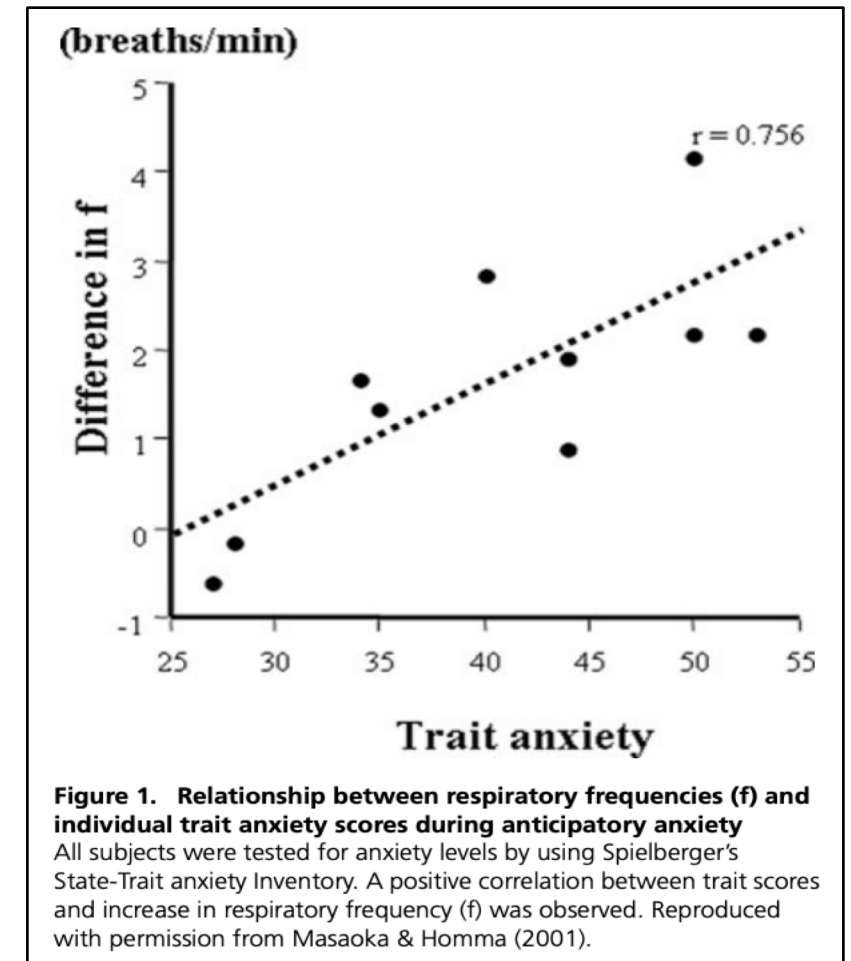
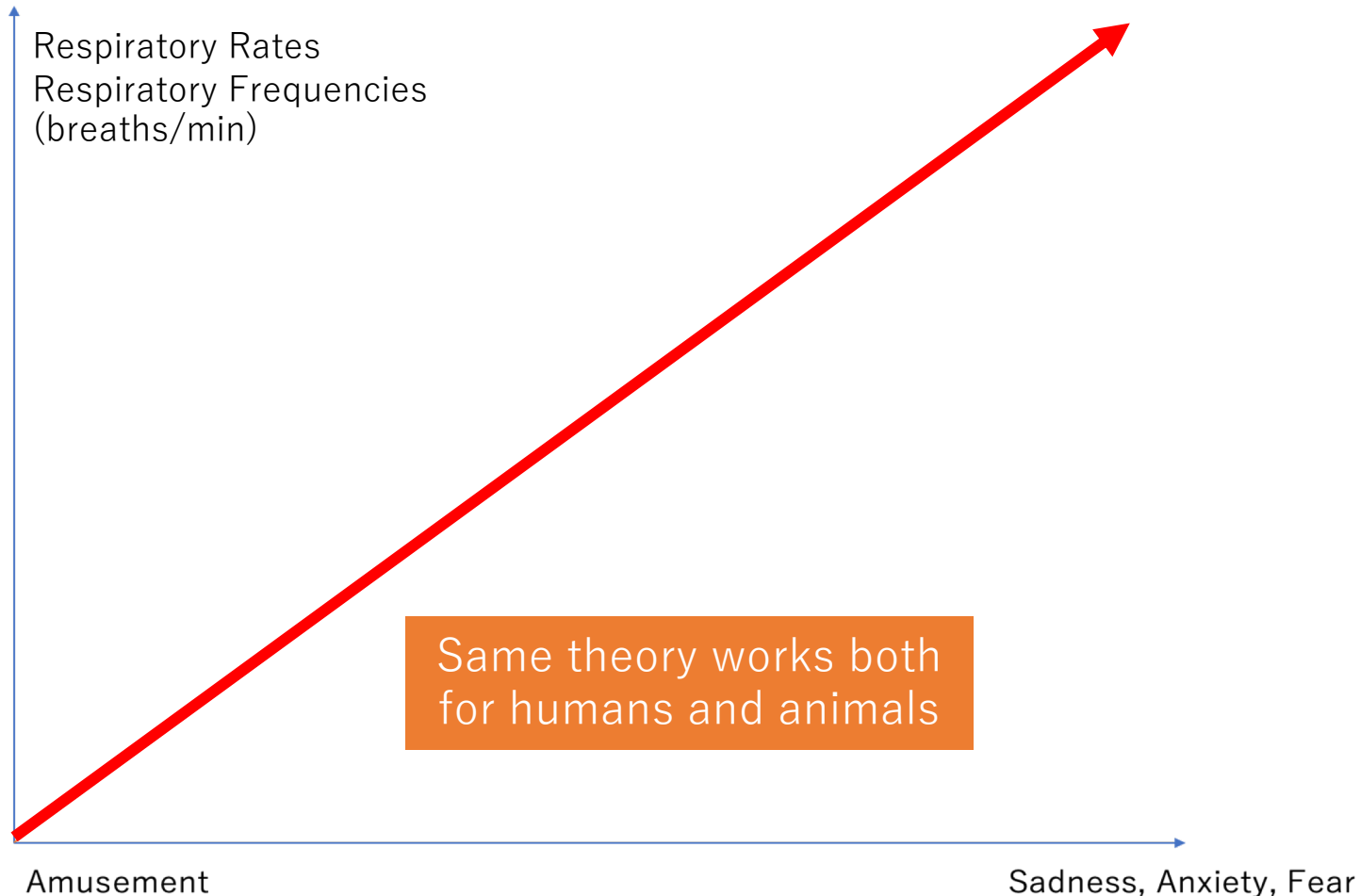
Homma. I and Masaoka. Y. (2008) "Breathing rhythms and emotions", *Exp Physiol* 93,9 pp 1011-1021

Masaoka. Y and Homma. I. (2001) "The effect of anticipatory anxiety on breathing and metabolism in humans", *Respiration Physiology* Vol 128, Issue 2, pp. 171-177

MedicalNewsToday: What is a normal respiratory rate?

# Proved Hypothesis

Higher Respiratory Rate (RR) shows Negative Perception and Lower does Happiness



Source:

Homma, I, and Masaoka, Y, (2008), "Breathing rhythms and emotions.", Exp Physiol 93.9 pp. 1011-1021.

Celso, M., Partick, K, and Jonathan, G (2010), "Real-time expression of affect through respiration.". Computer Animation and Virtual Worlds 2010; 21: 225-234"

# Algorithms for RR estimation

“RRest” – A Toolbox of RR Algorithms

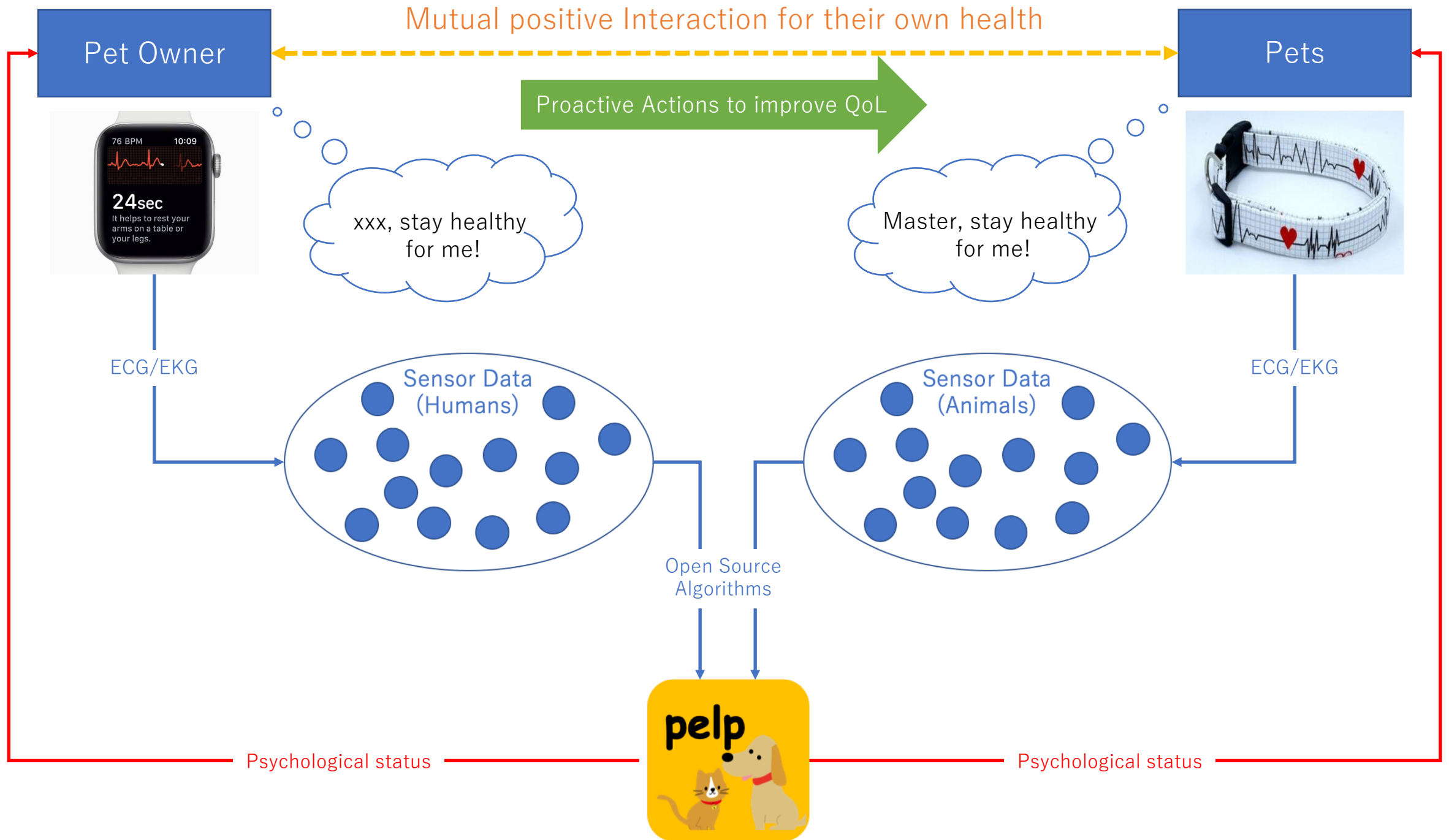
- In a previous study (Charlton et al, 2016) , open-source algorithms, “RRest”, are published to encourage RR research
- The principal goal of this open source project is to develop the algorithms by using “RRest”
- Contributions to this RR estimation project are most welcome like submitting new algorithms, datasets, suggestions, comments, criticisms, and so forth.

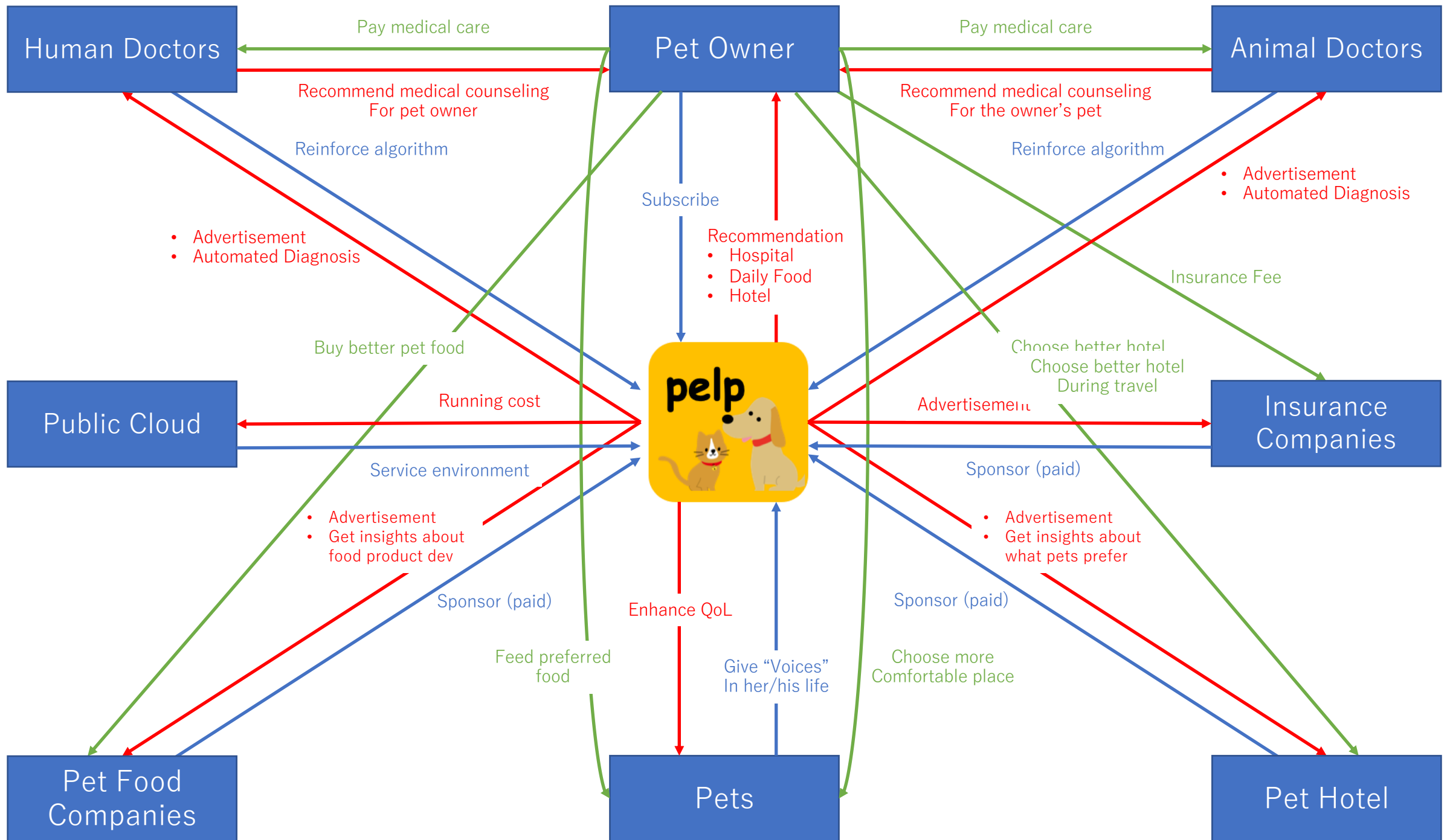
## **A Toolbox of Respiratory Rate Algorithms**

This page provides an overview of RRest, a toolbox of respiratory rate algorithms. Further information is available from the pages listed on the right hand side.

Source:

Charlton. P. H. et al. (2016) “An assessment of algorithms to estimate respiratory rate from the electrocardiogram and photoplethysmogram.”, Physiol. Maas. 37 610





# Any Questions?

*“Life is life – whether in a cat, or dog or man. There is no difference there between a cat or a man. The idea of difference is a human conception for man’s own advantage.”*

Sri Aurobindo (Author of The Life Divine)

## ONE HEALTH!!

